MOLLY M. LENS (S.B. #283867)
mlens@omm.com
DANIEL M. PETROCELLI (S.B. #97802)
dpetrocelli@omm.com
O'MELVENY & MYERS LLP
1999 Avenue of the Stars, 8th Floor
Los Angeles, California 90067-6035
Telephone: +1 310 553 6700
Facsimile: +1 310 246 6779

Attorneys for Defendant
Paramount Pictures Corporation

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

SHOSH YONAY and YUVAL YONAY,

Plaintiffs,

v.

PARAMOUNT PICTURES CORPORATION, a Delaware corporation, and DOES 1-10,

Defendants.

Case No. 2:22-CV-3846-PA

DECLARATION OF PATRICK S. MCNALLY IN SUPPORT OF DEFENDANT PARAMOUNT PICTURES CORPORATION'S NOTICE OF MOTION AND MOTION TO DISMISS PLAINTIFFS' FIRST AMENDED COMPLAINT

Hearing Date: November 7, 2022
Hearing Time: 1:30 PM
Place: Courtroom 9A
Judge: Hon. Percy Anderson

I, Patrick S. McNally, declare and state:

1. I am a member in good standing of the State Bar of California and am a counsel at O'Melveny & Myers LLP.

2. I am counsel for Defendant Paramount Pictures Corporation ("PPC") in the above-entitled action, and I make this declaration in support of PPC's Motion to Dismiss Plaintiffs' Complaint ("Motion"). I have personal knowledge of the matters set forth in this declaration and if called to testify to the facts stated herein, I could and would do so competently.

3. On September 16, 2022, my colleague Molly Lens and I met and conferred by telephone with Plaintiffs' counsel regarding the Motion. We explained that PPC intended to move to dismiss Plaintiffs' copyright infringement and declaratory judgment claims for, inter alia, the reasons explained in our earlier motion to dismiss Plaintiffs' original complaint. We also explained that PPC intended to move to dismiss Plaintiffs' new contract claim, as it was belied by the relevant unambiguous contractual language. Counsel for Plaintiffs disagreed, and the parties were unable to reach any resolution on the Motion. During this same discussion, Plaintiffs' counsel confirmed Plaintiffs' position that the Court has diversity jurisdiction over the contract claim because Plaintiffs and PPC are fully diverse and the amount in controversy exceeds $75,000.

Exhibits

4. Attached hereto as **Exhibit A** is a true and correct copy of Ehud Yonay's article entitled "Top Guns," published in *California Magazine*'s May 1983 issue.

5. Attached hereto as **Exhibit B** is a true and correct copy of a DVD of Paramount Pictures' 2022 film *Top Gun: Maverick*, a physical copy of which is being lodged with the Court.

6. Attached hereto as **Exhibit C** is a true and correct copy of an excerpt from Ehud Yonay's 1993 book *No Margin for Error: The Making of the Israeli Air*

Force.

7. Attached hereto as **Exhibit D** is a true and correct copy of an April 29, 1983 contract between Ehud Yonay and California Magazine, Inc.

8. Attached hereto as **Exhibit E** is a true and correct copy of a United States Senate report of a 1975 hearing before the Committee on Armed Services.

9. Attached hereto as **Exhibit F** is a true and correct copy of the copyright registration referenced in Paragraphs 21 and 69 of the First Amended Complaint.

10. Attached hereto as **Exhibit G** is a true and correct copy of Exhibit 1 of Plaintiffs' First Amended Complaint with an added column ("Row") for ease of reference.

11. Attached hereto as **Exhibit H** is a true and correct copy of a redline comparing Plaintiffs' Original Complaint and their First Amended Complaint.

12. Attached hereto as **Exhibit I** is a true and correct copy of a redline comparing Exhibit 1 of Plaintiffs' Original Complaint and Exhibit 1 of Plaintiffs' First Amended Complaint.

I declare under penalty of perjury of the laws of the United States that the foregoing is true and correct. Executed on September 28, 2022.

/s/ Patrick S. McNally
Patrick S. McNally

Exhibit A

$1.75 · MAY 1983

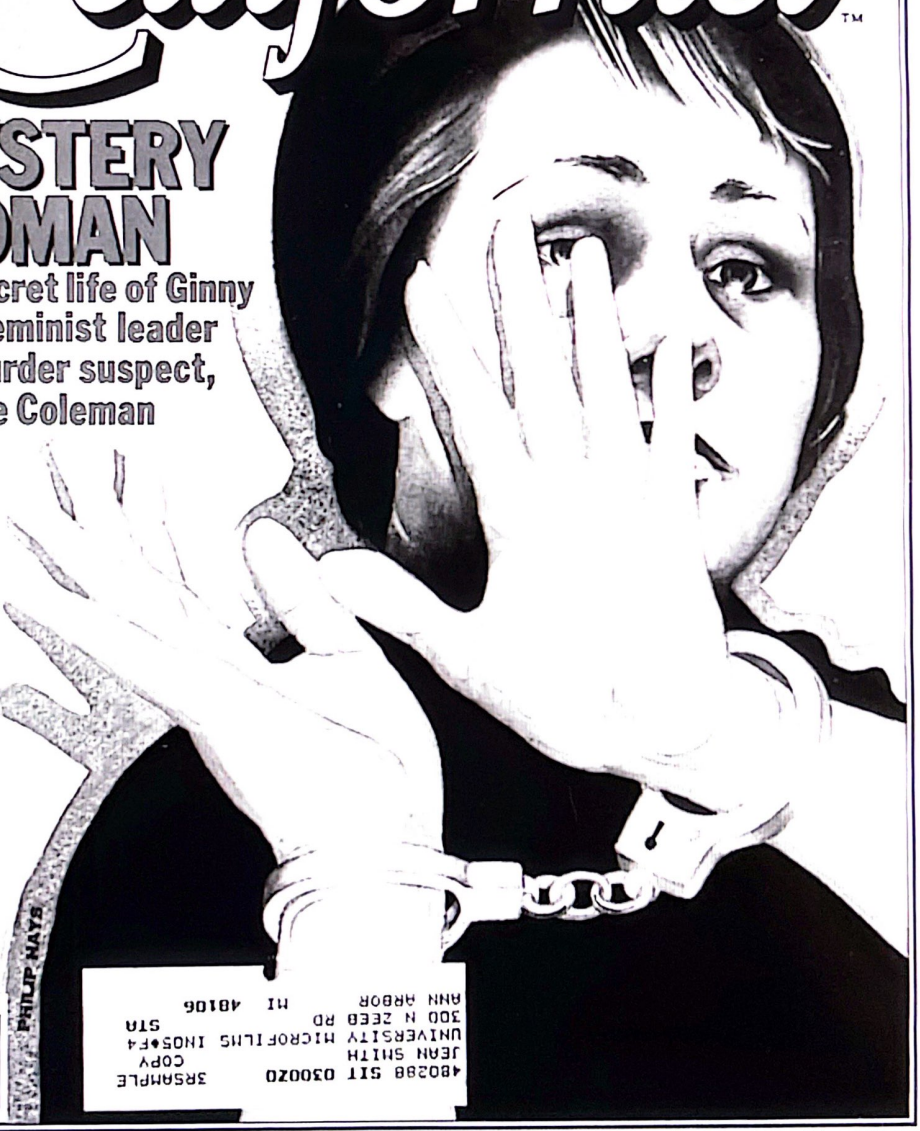
The Skyline That Ate San Francisco, by Steve Oney

Even Boas Get the Blues: Pet Hospital, by Delia Ephron

California

MYSTERY WOMAN

The secret life of Ginny Foat, feminist leader and murder suspect, by Kate Coleman



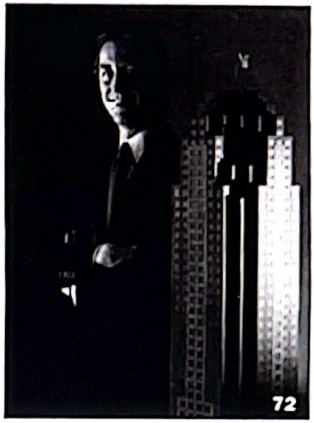
PHILIP HAYS

INCORPORATING NEW WEST

Vol. 8, No. 5

CONTENTS

May 1983



FEATURES

DEPARTMENTS

Cover: Illustration by Philip Hays.

COLUMNS

California Magazine (USPS 316-790) is published monthly by California Magazine, Inc. Ted Sell, President, mailing address PO Box 69990, Los Angeles, California 90069 (street address: 9665 Wilshire Boulevard, Beverly Hills, California 90212). (213) 273-7516. Subscription rates in continental U.S.: one year $15, two years $28, $27 a year for Canada and Mexico, and $12 a year elsewhere (surface delivery only). Payable in U.S. currency. Single copy price is $1.75. Back issues $3.50. Payment must accompany all single-copy orders. *California Magazine* is a member of the Audit Bureau of Circulations and the Magazine Publishers Association. Second-class postage paid at Los Angeles, California, and at additional mailing offices. Address all correspondence to *California Magazine*, PO Box 69990, Los Angeles, California 90069. **Postmaster: Send form 3579 to *California Magazine*, Subscription Department, PO Box 69300, Los Angeles, California 90069.**

For subscription information, write to Sharon Knerr, *California Magazine*, Subscription Department, PO Box 69300, Los Angeles, California 90069, or call (213) 273-7516.


PHOTOGRAPHED BY C.J. HEATLEY

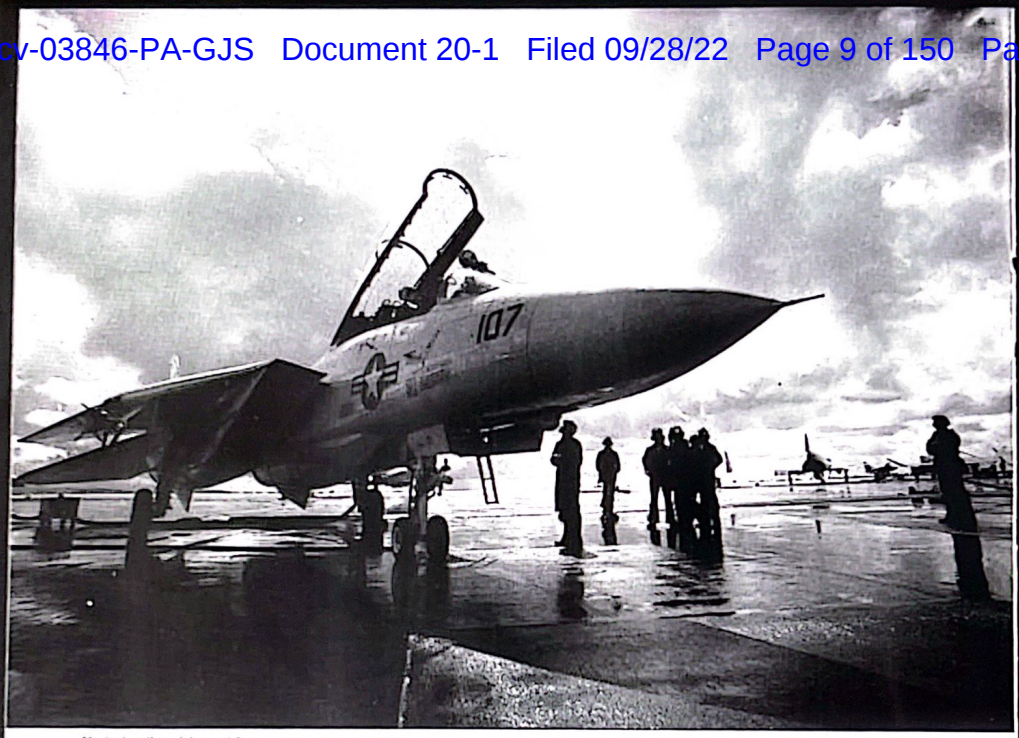
TOP GUNS

At Mach 2 and 40,000 feet over California, it's always high noon. By Ehud Yonay

YOGI AND POSSUM HAVE A THEORY ABOUT HOPS – THAT IS, AIR COMBAT MANEUVERS. "THE good ones always start out good," Yogi says, so the only thing to do is ride them through and try not to screw up. They're holding this thought as they blast off the oil-stained strip in their F-14 Tomcat and head out to hassle bogeys – "enemy" planes – off the coast of Ensenada. The preflight brief was short and to the point. The plane was ready, the takeoff smooth. A great beginning for a great hop.

Even the weather is great, and they're floating in their glass bubble through a regulation Southern California blue-on-blue crystal morning – clear skies over clear sea – with white curls of foam swirling around La Jolla below. They float past Mission Bay and North Island,

Inside the bubble: a Wolfpack pilot's view, past his "backseater" and into a wild blue filled with fellow F-14s.



Yogi (the pilot, right) and Possum (his radar intercept officer) strap themselves into the cockpit of their F-14 before blasting off into broken San Diego skies.

then Possum calls out a new heading and Yogi hangs left, and they're making straight for today's action.

Once over the Mexican border the, pick up speed, and Yogi starts jinking. He whips the stick—the steering mechanism between his legs—from side to side and the plane rolls this way and that, letting him and Possum spot anybody making for their tail. From where they sit, however, it's not their silver rocket that's rocking but the entire vast blue dome of sea and sky. There are no ups or downs up here, no rights or lefts, just a barely perceptible line separating one blue from another, and that line is spinning and racing like mad in the distance. Yogi was still in junior high school when he realized that flying straight and level might be okay for some people, but if you like yanking and banking—the feeling of riding inside one of those storm-in-a-bottle souvenirs—then there's just one place for you, and that's the cockpit of a fighter plane.

They're at just about the right spot, over international waters some 30 miles off Ensenada, when a voice crackles over the radio to warn of two bogeys 20 miles south.

"Fight's on," says Yogi, who is the pilot, or "stick," and sits up front.

"Roger," says Possum, the radar-intercept officer, or "backseater." He's already bent over his radarscope, punching buttons and looking for the tiny blips of the bogeys—hotshot instructors from Top Gun, the Navy Fighter Weapons School, flying their deadly little F-5s.

With that, Yogi stops jinking, peels off to the right, and pushes the throttle all the way into afterburner. As twin white-hot flames shoot out from the plane's exhaust nozzles, the magnificent silver machine explodes forward, slamming into their backs like a truckload of bricks and hurling them through the sound barrier. Yogi has rehearsed this kill in his mind a dozen times. He'll cut the first bogey off at the pass with a head-on missile shot, and then, breaking and rolling to avoid getting hit, he'll rein the plane in and pull it around like Ivanhoe at the end of the first joust and come racing back across the skies for the other. Great fighter pilots are always ahead of their planes, and, as his adrenaline surges up, Yogi's eyes bore into the empty blue space before him, looking for the bogeys. Nothing can stop him now.

That's when it happens. Suddenly a soft voice is saying "Atoll" in the earphones, and by the time Possum spots the little F-5 behind them it's too late. They've been racing fat and dumb and happy like a dodo bird, and the F-5—painted in desert camouflage, no less, which stands out against the blue like a billboard—just rolled in out of nowhere, got on their tail, and simulated slipping a heat-seeking missile up their exhaust pipe. Atolls are the air-to-air missiles that Russian-built MiG-21s carry, but in this exercise the word means, "Up yours, guys, you're dead and going home with your tail between your afterburners." Their glorious hop is all screwed up.

"I was just starting to transition from my visual scan aft to forward, and Possum's visual scan from inside to outside, and we're dead," says Yogi, who is 26 years old and has the gangly good looks of a John Travolta, in amazed indignation. That's pilot talk for driving without looking. "It started out good, but it sure got bad in a hurry," Possum says, laughing. He is 25 and more the Ryan O'Neal type,

Ehud Yonay's last feature, "King Cotton" (December 1982), chronicled a year in the life of a Kern County family farming operation.

PHOTOGRAPHED BY TOM KASSER

"You fight like you train," fighter pilots like to say, "so you'd better train like you're going to fight."

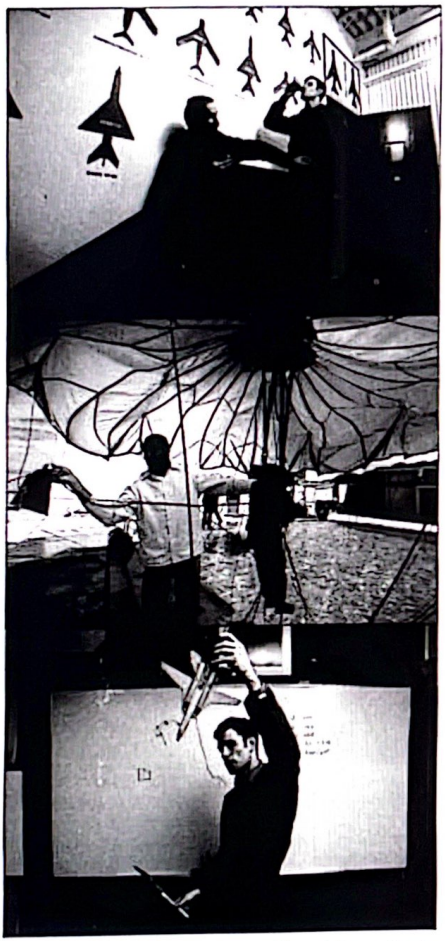
with brown hair and mustache. "You wish you could do it over again," he says, "but in the real world you're not going to get a second chance."

It is evening, and the briefing room is quiet. There is a faint aroma of sweat and boot polish and jet fuel in the air. Everybody has left the hangar to bend elbows and play video games and talk great hops at the officers club, but Yogi and Possum stay behind, slouching at their desks in their black flight boots and green flight suits with red turtlenecks showing. They can think of any number of other hops they'd rather talk about. Good hops. "In this business you hate to lose," Yogi says, "and getting shot is synonymous with losing—getting your parachute and dying and all that sort of thing." He walks to the blackboard and picks up a couple of fighter plane models. Holding the F-14 straight and level in his left hand, he raises the little F-5 with his right and rolls it down behind the F-14, describing what happened. "You feel just like kicking yourself in the butt," Possum says.

What makes this particular screw-up even worse is that Yogi and Possum are not with their regular squadron, the VF-1 Wolfpack based at Naval Air Station Miramar in San Diego County. For the last two weeks they've been training at Top Gun, Miramar's internationally known Navy Fighter Weapons School. Just getting here was the ultimate break. Only the best young flyers in a squadron ever make it, and they have already raced past most fighter pilots their age. If they play it right and look sharp, they might even get invited back as Top Gun instructors—which is as high as a fighter pilot can get.

And now they have only three weeks left to make it up. "All you can do at this point is make sure that no wild card ever, *ever* jumps on your tail again," Possum says.

Yogi shrugs. "It's Miller time," he says, hanging up the little model planes, and they head out into the night.



Top: Possum (left) and Yogi take a break at Miramar's Hangar Number One. On the walls are silhouettes of MiGs shot down in combat by Top Gun graduates. Center: The water survival course prepares young pilots for bail-outs over the ocean. Bottom: Yogi describes a hop in the briefing room.

WHEN YOGI AND POSSUM return from a hop and fly into Naval Air Station Miramar, the first thing they see at the end of the runway is a huge red sign stenciled the length of a low, 300-foot-long building: WELCOME TO FIGHTERTOWN, U.S.A. Though the call sign of Miramar is "Home of the Pacific Fleet Fighters," Fightertown is handier and far more appropriate, since the entire mission of this sprawling 24,000-acre base—wedged inside a fork formed as I-15 and I-805 cross diagonally some fifteen miles north of San Diego—is to primp and fuss over several hundred fighter jocks so that when the time comes and they're staring down the missile racks of a Russian MiG, they are primed and ready.

Lieutenants Alex ("Yogi") Hnarakis and Dave ("Possum") Cully are what naval lingo terms a "crew," or an F-14 team. There are twelve crews in each fighter squadron—in their case, the VF-1 Wolfpack—and there are a dozen such squadrons stationed at Miramar, home base of all the fighter squadrons assigned to the U.S. Pacific Fleet. In "our" half of the world, starting at the California coast and stretching west to the tip of Africa, the Pacific Fleet maintains two battle groups in constant readiness, one in the Indian Ocean and the other in the Pacific. Bigger than many small nations' entire navies, each battle group—consisting of some half dozen guided missile cruisers, two dozen or so destroyers and frigates, and an aircraft carrier equipped with various early-warning, submarine-patrol, and attack planes—is, in effect, a floating hunk of American territory that can carry a battle to the enemy's doorstep, thus keeping it from our own. But these armed flotillas are sitting ducks. In the Falkland Islands last summer, all it took was one Exocet missile from a plain-vanilla Super Etendard Argentinian plane to sink the destroyer HMS *Sheffield*, pride of the British Navy. No matter how big the ship or how long its cannons, it is helpless without the assurance of "air superiority" over the battlefield.

That's where fighter pilots such as Yogi and Possum figure in. Aboard each carrier are two F-14 fighter squadrons whose job is not only to protect the battle group against air attacks but to ride shotgun over the carrier's three squadrons of attack planes as they go about their bombing and strafing sorties into enemy territory—what the navy calls "power projection." This is the

PHOTOGRAPHED BY TOM KASSER

anachronism of fighter aviation. Even in this age of remote-control, push-button warfare, the survival and effectiveness of the entire U.S. Pacific Fleet rests on a few dozen young men getting themselves catapulted off a flight deck and hanging it in the skies against numerically superior, land-based enemy planes.

"It's like in the old days," says Commander Jack ("Gringo") Snyder, leader of the Wolfpack, "when one knight from each side would come out and they'd joust, one on a white horse and one on a black horse." Tall and wiry, which comes from doing 200 push-ups and 100 sit-ups a day in preparation for the joust, Gringo flew an F-4 Phantom in the Vietnam War. He knows that even the greatest air battle is a series of individual duels—that, while a dozen pilots may blast off a carrier at one time, once they get up there they are alone, hurtling through enemy air at 750 miles an hour and tilting against tiny motes of silver that zoom out of the blue to become fire-spitting machines.

Which is where keeping bogeys off your tail and that little hop off the coast you train, so you'd better train like you're going to fight," fighter pilots like to say. It is also where Top Gun comes in. If Miramar is a fighter pilot's Camelot, then the Top Gun complex in Miramar's Hangar Number One is King Arthur's Round Table, the gathering of the greatest of the greats in fighter aviation. Since its inception in 1968, Top Gun's hotshot aces have virtually revolutionized the fighter pilot business and, with the possible exception of the Israeli Air Force, established themselves as the international masters of the deadly art of air-to-air combat.

Like the notion of the single-combat warrior, there is something slightly nostalgic about Naval Air Station Miramar. At night the darkened base could be mistaken for an old *From Here to Eternity* set, and even earlier in the day, when the base is bustling, it is enveloped in a time warp of unreality. Not just because it looks like a small desert town out of the 1950s—tract houses, a supermarket, a Baskin-Robbins ice cream parlor, a golf course, and a bowling alley complete with a Lucky Strike Tavern and Ten Pin Café—but because it has no real reason for being here. The only centers of activity, activity that matters, are the stretches of runway at the south end and the officers club at the north. If an earthquake struck tomorrow and shook everything off the base except the flight line and the O club, few pilots would know the difference.

Among the fighter pilots at Miramar, "officers club" does not refer to the sprawling complex of dining rooms and meeting halls, but rather to the small space at the heart of the building that begins in a vestibule covered from floor to ceiling with heavily carved wooden plaques—more like coats of arms—of the various squadrons. This is the entrance to the WOXOF Room, the inner sanctum of Miramar's knightly order. (In aviation circles the letters and zeros in WOXOF refer to various unfavorable weather conditions—*X* means "obscured," for example, and *F* means "fog"—and strung together the letters mean, "You're grounded, why not make the best of it?") Inside, the walls are hung with more squadron emblems, and there

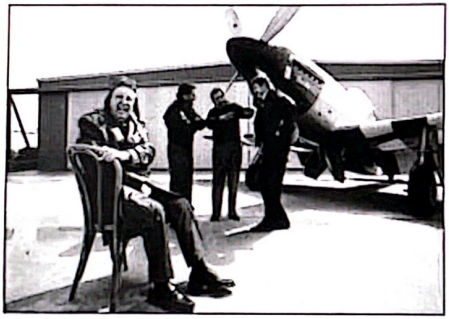
FIGHTERTOWN, U.S.A.

Old pilots never die—they move to San Diego.

NAVAL AIR STATION Miramar may be the "official" Fightertown, U.S.A., but if you were to paint the name on the side of a blimp and send it soaring over all of San Diego County you would still be on the mark. Ever since the dawn of the dogfight age, ex-fighter pilots have drifted to this balmy land of azaleas and great blue yonders.

At Palomar Airport Dick Martin lovingly restores old World War II Spitfires and Corsairs and P-51 Mustangs for use in films or TV series such as *Baa Baa Black Sheep*, based on the daredevil exploits of Gregory "Pappy" Boyington and his unruly VMF-214 squadron. Just a few miles away in Escondido, Richard Rossi, a Flying Tigers ace who actually flew with Boyington, raises avocados. Thomas Lanphier—who on April 18, 1943, shot down a Japanese bomber carrying Admiral Isoroku Yamamoto, architect of the raid on Pearl Harbor—lives in San Diego, and so do Zeke Cormier, who shot down eight Japanese planes in World War II, and Charlie Stimpson, who has twice as many notches on his World War II record.

The North San Diego branch of the Fighter Aces Association alone has twelve members, each of whom shot down at least five enemy planes, and some go back to World War I. Robert M. Todd shot down five German planes in the summer of 1918, then told all about it in his book, *Sopwith Camel Fighter Ace* (Ajay Enterprises, 1978). The Fighter Aces Association meets every three months at the Rancho Santa Fe Inn "to tell war stories and lie to one another a lot," says Cormier, and other fighter pilots congregate at the San Diego Aerospace Museum in Balboa Park. Many, however, make their pilgrimages to Miramar.



(Left to right) World War I pilot Robert Todd, Zeke Cormier and Tom Lanphier, who flew in World War II, and Willy Driscoll, a Vietnam ace.

There, just outside the WOXOF Room of the officers club, where today's young fighter jocks trade tales of great hops, is the base's Aviation Hall of Fame, a 30-foot hallway covered with portraits of aviation legends from Charles Lindbergh to Chuck Yeager. In a large room at the end of the hall, members of the 50-year-old Daedalian club gather on the second Thursday of each month to hoist a toast to comrades who have flown their last flights and to wish happy landings to those who still show up. They span the history of fighter aviation, these men who flew Jennys and Mustangs and F-8 Crusaders. Some go clear back to the beginning. Navy Commander Carlton D. Palmer, 93, made the first flight off a battleship back in 1922, launching his Sopwith Camel off a makeshift ramp atop the gun turrets of the USS *Texas*, and a year later he made the first carrier landing in a military plane. Somehow, to hear him tell it, it doesn't seem so long ago.

—E.Y.

PHOTOGRAPHED BY TOM KASSER

You never get used to night carrier landings. If you do," Organ says, "there's something wrong with you."

are glowing Zaxxon and Donkey Kong video games and a small stage lit in reds and greens where, this evening, two young and zesty girls in bikinis are disco dancing.

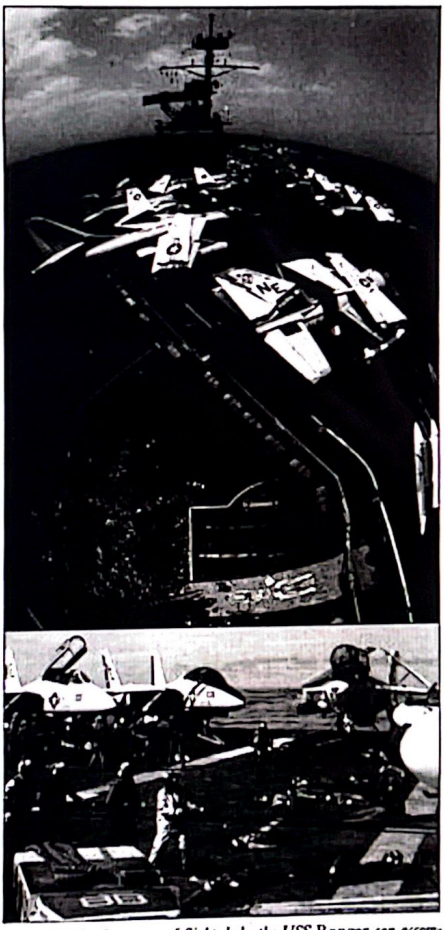
It is the Wednesday night happy hour, and the small, noisy room is packed with pumped-up fighter jocks. There is a lively trade at the bar, mostly in light beer, but out of this crowd of 50 or so men no more than 3 are looking at the nearly nude dancers. With raw sex waving right in front of their eyes, these supremely healthy young males are standing around in twos and threes and talking about the hop. You don't even have to listen to catch on—just watch their hands tracing loops and rolls and aerial ambushes with the grace of a ballerina's.

Lieutenant Commander C.J. ("Heater") Heatley is one of the Wolfpack's top F-14 drivers. Tall and boyish, with curly brown hair and quiet blue eyes, Heater likes to think things out, such as the reason fighter pilots hang together and "shoot off their watches" in the WOXOF Room. They do it, he says, for the same reason stunt men or Joseph Wambaugh's cops or anybody else who hangs it out there for a living heads for a bar after a day's work. "You're out there supersonic going from deck to 40,000 feet and back down to the deck, simulating killing people and getting yourself killed, handling actual emergencies, and when you finally come in and land you can't even tell your wife about it," he says. "How do you explain 6.5 Gs [six and a half times the force of gravity]—that you're sitting there and you weigh 200 pounds, but when you turn for that bad guy you suddenly weigh more than 1,300? Or how if you pull too many Gs a lot of times you start to black out, and how do you explain that you were in an airplane flying around and you blacked out?"

So that's the torture. But what about the good things?

Heater throws up his hands. He knew it was pointless even to try to explain. "But those *are* the good things," he says. "That's not torture, that's good. I *like* pulling Gs. I *like* strapping on 25 tons of airplane and hustling around the sky. I like that."

So that's where it all starts. With the love of flying.



Top: With its four acres of flight deck, the USS Ranger *can accommodate as many as 85 planes (their wings folded while parked)—and two sunbathers. Bottom: In the mass casualty drill, the entire carrier crew enacts various worst-case scenarios, including nuclear attack.*

PHOTOGRAPHED BY C.J. HEATLEY

ALEX HNARAKIS WANTED TO FLY ever since he was twelve, when in 1968 he sat in front of the TV at his parents' home in the suburbs of Washington, D.C., and watched the Apollo 8 astronauts flying around the moon. So once out of high school he cut off his long hair, shaved his beard, and entered the U.S. Naval Academy in Annapolis, Maryland. There was a small flying school at a nearby civilian airport, and in his senior year he logged a few solo hours—it wasn't military flying, of course, more like putt-putting around inside a lawn mower with wings, but it was better than nothing. He graduated in 1978, six months before his flight training was to start, and was put on temporary duty with VF-111 squadron at Miramar, which was just switching from F-4 Phantoms to awesome F-14 Tomcats. Suddenly he was hanging out with real fighter pilots, sitting in on real briefings, and even hitching rides in the backseat of an A-4 Skyhawk, getting bumped and bounced and breathless pulling Gs. It blew his mind, he remembers, but there was an admission price to this land of the giants. "I had to do well in flight school," Yogi says, "because only by being at the top of the class could I get my choice of flying fighters, and get to fly F-14s." In September 1980 he finished flight school at the top of his class and, with his new gold wings glistening on his tropical khakis, headed for VF-124 squadron at Miramar.

Dave Cully was born in Detroit and grew up in Newport Beach. He wanted to fly, too—just like his older brother, an army helicopter pilot in Vietnam—but his brother told him to be smart, to go to college and take ROTC on the side. He entered UCLA in 1975, played ice hockey and lacrosse, and in June 1979 graduated as an officer with a degree in economics. He already knew he couldn't be a pilot. His eyes weren't good enough. But navy fighter planes have two-man cockpits, and the sight requirements for backseaters aren't as strict. "It was like, there were the cards, and I could take my hand or walk out," Possum says. "But I wanted to fly." He was "stashed" on temporary duty at the Navy Fighter Weapons School at Miramar. In the summer of 1980 he came out of flight

school with his Naval Flight Officer wings, married his high school sweetheart, and was assigned to VF-124. That's where Yogi and Possum met, while learning to fly F-14s.

Yogi had flown jets in flight school—the T-2 Buckeye and A-4 Skyhawk—but moving up to the F-14 Tomcat meant crossing the magic line that separates the men from the boys, like first-time sex, glorious and terrifying. The difference is the afterburner, an engine component that at the pull of a throttle begins to burn huge amounts of fuel at incredible speed, resulting in a burst of power that no ordinary jet engine can duplicate and no plane but a fighter ever needs. "Just getting into an afterburning aircraft is a sensation most attack guys will never know—that feeling of power," says Lieutenant Rick ("Organ") Hammond, a member of the TK Top Gun squadron. "The first time I lit the afterburner in an F-14, the airplane just, you know, just literally *moved*."

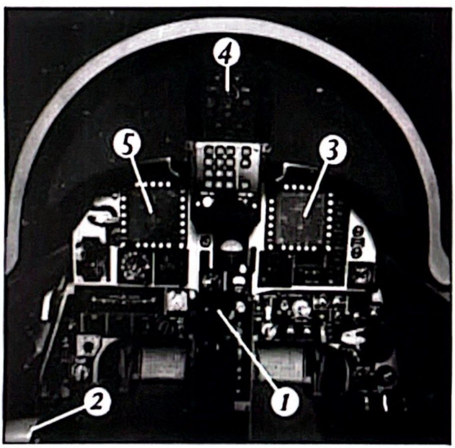
The F-14 Tomcat is the U.S. Navy's supreme air war machine, a huge, luxurious monster that could have been designed by the *Star Wars* special effects crew. Its wings can sweep back for fast flying or open to the sides like an eagle's for landing, or just for cruising around—"loitering" in navy jargon. It can shoot up to 30,000 feet in one minute, fly at more than twice the speed of sound, and haul seven tons of guns and missiles—including the heat-seeking Sidewinder, the radar-guided, mid-range Sparrow, and as many as six Phoenix missiles, half-ton monsters that can home in on a bomber more than 100 miles away. In fact, the F-14's radar system can track 24 targets at once and fire six missiles in six different directions in rapid sequence. By comparison, the much smaller Russian MiG carries little more than guns and a few missiles, and must get quite close to a target—directly behind in order to use its heat-seeking Atolls—to hit it.

But the F-14 does have its drawbacks. The plane's enormous size is a disadvantage (it can be seen as far away as ten miles), and it is so technically complex that it takes between 20 and 25 hours of work by ground crews to keep it flying for just one hour. The biggest problem, however, is the F-14's price. The next batch of Tomcats to roll off the Grumman Aerospace assembly line on Long Island will cost $36 million apiece, which doesn't leave much for an adequate stock of spare parts or for new replacements for the plane's troublesome TF-30 engines. The TF-30s "have been, over the years, on a comparative basis, stall-prone," says Rear Admiral George M. ("Tiger One") Furlong Jr., commander of the Pacific Fleet fighter squadrons. At high angles of flight, not enough air flows into the engines, and they die—and in very rare instances the only way to restart an F-14 in the air is to point it nose down and dive until the airflow starts the fans going.

The F-14 has been plagued with other technical troubles since its introduction in 1972, and in 1976 a deadly streak of accidents swept Miramar, killing four men in one 48-hour period alone. That none of these accidents dampened the pilots' enthusiasm for the plane is just another clue to the fighter pilot's code. "They have an incredible denial mechanism," says Captain R.A. Millington, flight surgeon

DREAM MACHINE

Step into the Tigershark–the ultimate video game.



SUPER ACE CHUCK YEAger, the first pilot to break the sound barrier, once said that "of all the airplanes in the world that I've flown, the F-5 is the most fun to fly." The F-5 is actually a family of planes, starting with the F-5A back in 1964 and culminating last year with the F-5G Tigershark (now called F-20). All are elegant, zippy beauties with body lines so trim they look like canoes with wings.

The only fighter plane made in California, the F-5 is an anomaly in the high-budget defense business. It is not only small, effective, and easy to repair, but it is also very cheap. The F-5E Tiger IIs used by Top Gun instructors to simulate Russian MiGs cost around $5 million each, and even the top-of-the-line Tigershark lists at only $9 million—one quarter the price of a single F-14 Tomcat.

The navy could court-martial anyone it caught showing off the classified cockpit of the F-14, but here's how to make a hop in an F-20:

1. The stick. Say you're entering bogey country. To find out what's ahead, push the air-to-air weapon select button with your right thumb. (This is basically an "on" switch—your head-up display and digital display indicators are now operating.)

2. The throttle. With your left index finger, select "range while search." A plot (which looks like a radarscope) of the range in question will appear on your right-hand digital display indicator.

3. The right-hand digital display indicator. If there's a bogey out there, it will appear on this screen as a small black square. To lock your radar onto its tail, press the throttle's acquisition button until the screen's acquisition symbol (two parallel vertical lines) brackets the target. Suddenly the acquisition symbol disappears, and a numbered aiming circle appears around the black square—this tells you at a glance how fast, how high, and in what direction the bogey is going.

4. The head-up display. From this point on, you can look straight through your head-up display and see both the real target and the head-up steering circle (which looks like a bull's-eye) simultaneously.

5. The left-hand digital display indicator. On this screen is a list of your available missiles and gun ammunition. Once you have picked your weapon, maneuver the plane until the head-up display's steering circle is directly over your target. When you reach the proper range the word SHOOT will flash onto your head-up display. Pull the stick's missile release or gun trigger with your right index finger. *Bingo.* —E.Y.

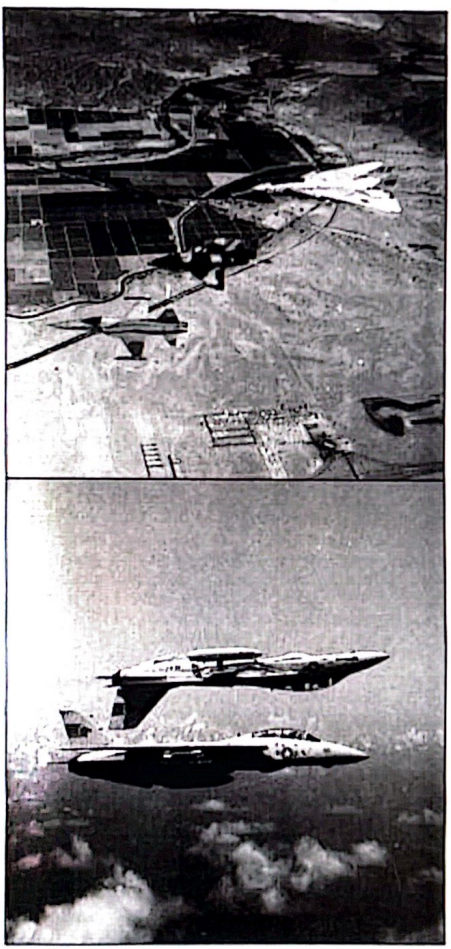
"How do you explain 6.5 Gs?" Heater asks. "That you make a turn and suddenly weigh 1,300 pounds?"

for the Pacific Fleet's aircrews. When an aviator dies, his picture is removed from the squadron roster, his locker emptied of his personal belongings, and all other traces of his presence on the base are obliterated. Even accident reports that clearly demonstrate technical failures don't erase the lingering doubt. "You think there must have been *something* he could have done and didn't—that if it were you it wouldn't have happened," Heater says. "Such planes take off and land every day without accidents, so obviously it can be done."

It takes nine months to learn how it is done. You start by spending hours and even days in flight simulators that cost as much as real planes but can't crash and don't use gasoline (you can train an hour a day for a whole week in a simulator for what it would cost to fly 60 minutes in an F-14, which burns $1,500 an hour in gas alone). Some of the simulators are simple—a cockpit with a small screen in front—but once you master the basics you're ready for the highest high-tech high, the 2F-112, the world's ultimate video game.

You don't just sit and play the 2F-112, you walk into it like an H.G. Wells traveler stepping into the time machine. You and your radar intercept officer climb up and strap into an F-14 cockpit mounted twenty feet high, at the center of a 40-foot-diameter spherical room. The lights go off, and suddenly the entire dome becomes the great outdoors. The illusion of flying is total—move the stick and the scenery moves in response, rolling and soaring and falling. The real action begins as the bogeys start coming at you, and you pull and push and twist the stick, trying to keep them off your tail and get onto theirs instead. Screw up and you go into a spin, and if you don't make the right moves to pull out of it, you crash. The room goes black.

Simulator flights are followed by real flights—low and high, formation flights and air combat maneuvers—and finally, by the last month of training, there's one thing left to do before you join your permanent operational squadron. It is something so awful, so mortifying, that the dread of it stays with pilots for as long as they remain naval aviators. "There's some fear every time you're in the air, mixed with excitement and thrill and tension," Yogi says, "but a night carrier landing is the only thing that is sheer, unmitigated terror." You've done day landings on carriers back in flight school, of course, and practiced night landings on the silhouette of a flight deck painted on a regular runway. But nothing, *nothing* prepares you for what's coming next.



Top (left to right): An F-5E Tiger II, an A-4 Skyhawk painted in camouflage, and an F-14 Tomcat head home after dogfighting over Yuma, Arizona. Bottom: Two F-14 pilots demonstrate the agility and grace of their 25-ton monsters in a classic Blue Angel "back-to-back" maneuver.

You are flying out of a black sky onto a black sea, and suddenly you see a dot of white light miles away in the void. The voice on the radio tells you that's the ship down there, but all you see is the little light you must follow down into the controlled crash that is a carrier landing in the best of times. If you are lucky the sea is calm and the air is clear, but if the light bounces in the dark you have no way of knowing which is moving, you or the ship. All you know is that somewhere down there is a 60-foot wall of steel and only 700 feet of deck. If you hit too low you'll have to be scraped in bits and pieces off the side of the ship, and if you come in too high and fail to snag the restraining cables with your tailhook you'll have to come around again—and you've already screwed up once.

The VF-1 Wolfpack was out on cruise in the Indian Ocean one particularly rough, dark night when a pilot had to come around twelve times. *Twelve times.* The poor guy had nowhere else to go, and he came around and around, burning so much fuel that twice tankers launched off and refueled him in midair and landed on the pitching deck while he was still out there trying to make it down. When he finally did, he hit the deck so hard that he damaged the plane, and when he climbed out of the cockpit he was crying and looked like an old man. "You never get used to it," says Organ, who sat up half that night watching his buddy trying to come back out of the sky. "If you do, there's something wrong with you."

By the fall of 1981 Yogi and Possum had finished their training at VF-124 and were assigned to their permanent squadron, the VF-1—the squadron they will fly to battle with in the event of war. For as long as they remain with the Wolfpack, it will be their home and family, security blanket and confessional

PHOTOGRAPHED BY C.J. HEATLEY

circle. Possum's wife, Lisa, has already joined the Wolfpack's wives group, her family when Possum is out at sea, and in time she will realize that her husband will spend more hours of their married years with Yogi than with her. Indeed, shortly after Yogi and Possum joined the Wolfpack, they began training for a sea tour, and in a few months they were ready. Possum helped Lisa lock up the apartment and store their belongings, then drove her to her parents' home in Newport Beach, where she would stay for as long as he was at sea. And on April 7, 1982, the Wolfpack took off from Miramar and landed aboard the USS *Ranger*, already under way 100 miles south of San Diego. It would be six months before they'd be back.

SPACESHIP DESIGNERS COULD USE the aircraft carrier as a model. With 5,000 men aboard, it is a floating steel city, complete with office suites, apartments, parking lots, and machine shops securely hidden under a deck so solid that a 25-ton plane can crash onto it and it won't even be felt below the main level. And as in any city, one can live and work for months and meet only a handful of people and never visit entire neighborhoods.

On Yogi and Possum's first cruise the *Ranger* stopped in Hawaii for a few days, then for four days in the Philippines, where several time-honored naval aviation customs were followed. A team was sent out to look over the wood-carving shops in downtown Manila and place an order for a new Wolfpack plaque to hang at the entrance of Miramar's WOXOF Room. Then the entire squadron was measured for snazzy new red-on-gray flight suits, which downtown tailors could whip up for only $27 each. By the time the *Ranger* stopped by again on its way home, everything would be ready. The next port was Singapore. There Gringo located a good-size brass bell that the Wolfpack would also present to the club when it returned.

But then the *Ranger* reached the Indian Ocean and stayed there for 101 days, and the fun was over. It finally dawned on Yogi that yanking and banking has a deadly intent. Naturally he knew that being a fighter pilot meant that someday he might have to go into real-life battle, but it wasn't something he looked forward to. "I'm no warmonger," Yogi mused one evening. "I don't care if we never go to war. The only thing is, if we do I'd like to be there." One day an order came over the carrier's speakers, and Yogi and Heater blasted off the deck like human cannonballs, their F-14s loaded to the gills with live ammo. Heading their way was a massive Russian plane that looked like a transport but could have been anything. As they escorted the plane away, Yogi edged up so close that he could look over and see the Russians in their cockpit, staring at him and snapping photographs. He waved the way one does when someone is taking pictures, but the Russians didn't wave back—not even when Yogi's backseater took their picture.

Yogi and Possum flew at least once a day off the *Ranger*, but most flights were ordinary patrols or exercises. There was little air combat, except when a few F-14 drivers would head out to a randomly selected "MiG alley" over the ocean and practice dogfighting. Years ago, legend has it, some of the men on a cruise would play other games, games they would have been drummed out of the navy for if they were ever caught playing. In the game of "thumping," a guy might be flying straight and level without a care in the world when another would come slinking behind and below, then shoot under him and go into a sharp climb right in front of his nose—not only scaring the living daylights out of him but interrupting the air currents around his wings.

Though Yogi would dogfight with the best of them, he was almost too serious for the Wolfpack crowd, and he tried to use those long ocean flights to improve his flying skills. "He was like a sponge, soaking it all in," says Heater, once an instructor at Top Gun and Yogi's instructor on the cruise. They spent hours talking tactics in the briefing room before and after missions and in the dining room during meals, and then Heater began teaching Yogi classic air maneuvers such as the "vertical egg," in which two planes chase each other in ever-widening vertical loops. And while Yogi was learning from Heater, Possum was doing the same sitting behind Gringo.

Finally, after more than three months in the steaming Indian Ocean, the *Ranger* started to head home. The first stop would be Perth, Australia, and the Wolfpack was determined to do it in style. Few of the men knew how or when Gringo had planned it, but no sooner had the *Ranger* dropped anchor than a glorious sailing yacht materialized alongside with a huge sign on its mast: WELCOME WOLFPACK. When the VF-1 gang got on board there were bottles of chilled champagne waiting, which they hoisted in full sight of the poor suckers still waiting to hitch a ride to shore.

The first thing Yogi did when he got in was pull out a phone book, call up a couple of skydiving clubs, then head out with them to do some free-falling. Possum and a few of the others rented a car and went sight-seeing. Before blowing town, however, the Wolfpack organized a bash. The invitations—engraved—went out to every city official in Perth they could think of, as well as to the other fighter squadrons. That, everybody had to admit, was class.

But nobody expected class at Subic Bay near Manila, where the *Ranger* then stopped for five days. Sometimes it seems that the only reason the Cubie Point naval base was built there, with its officers club high on a hill overlooking the bay, was to give naval aviators back from a cruise a place to let off steam. Anything goes, including, after enough beer went down one evening, pushing all the tables together in the shape of a carrier deck, stretching a few towels across, and doing belly landings. Somehow somebody remembered to pick up the new Wolfpack plaque and the custom-made red-on-gray flight suits, and even to have Gringo's big brass bell mounted on a specially engraved base.

Delivering the bell to the WOXOF Room was a great event. It was no ordinary bell. The Wolfpack had brought it for a purpose, to help uphold the club's bylaws, which state that a bell should be rung on two occasions—when someone walks into the club with his hat on, or when a customer finds himself behind the bar. On either occasion, the transgressor picks up the tab for everybody's drinks. Of course, to hang the bell the Wolfpack had to get behind the bar, but what the hell—the going was still first class.

Shortly after they returned to Miramar, Yogi and Possum were assigned to fly together. They had done well separately on the cruise, and even better once they became a team. In fact, they did so well together that last January they were told to report to Top Gun for air combat training. Now they would learn what being a fighter pilot is really all about.

IF WAR BROKE OUT AND THIS country's aviators were ready for it, it would be a first, and the credit would belong entirely to Top Gun, located in a second-floor cubby of offices at the east end of Hangar One at Miramar. There is history on the high walls that flank the pipe-railed stairway—they are covered with red stenciled silhouettes of MiGs shot down in combat by Top Gun graduates. For a young fighter jock swaggering up the stairs in a brand-new flight jacket, the effect is awesome. At the top of the staircase are two large silhouettes stenciled in black. They are two Libyan SU-22 jets bagged in 1981 over the Gulf of Sidra by two F-14 crews from the USS *Nimitz*, and the only air kills

(continued on page 144)

TOP GUNS

(continued from page 102)

since the Vietnam War.

In 1964, just as Yogi and Possum were entering the third grade, North Vietnamese gunboats fired on the U.S. destroyer *Maddox* in the Gulf of Tonkin (or so President Lyndon Johnson insisted), a war flared up, and suddenly hotshot naval aviators were getting creamed by Charlie pilots who were just learning how to drive their early-model MiG-15s and -17s. The navy was losing one Phantom for every two MiGs it bagged. A 1968 study commissioned by the navy concluded that the problem was missiles that didn't work and aircrews who didn't know how to dogfight, and it recommended the establishment of a fighter-pilot school. In reality, the whole thing was a monumental Pentagon screw-up. The navy's brand-new, high-tech F-4 Phantoms were designed, and their pilots trained, to intercept high-flying Soviet bombers—to scramble up, locate the target on the radar, nail it from behind with a missile, and come home. Easy. But confronting those fast little MiGs was something else.

In the spring of 1969 a few crack flight instructors with VF-121, the F-4 Phantom training group at Miramar, got together in a small trailer outside their hangar to establish the U.S. Navy Postgraduate Course in Fighter Weapons Tactics and Doctrine. In time it would be renamed the Navy Fighter Weapons School, but it was Top Gun—the name of an annual air-to-air gun competition held by the various armed services in the 1940s and '50s—that stuck. Inside the trailer were two tiny offices, a narrow hallway, and a room into which the first class of eight could barely fit, but it was the birthplace of a revolution in fighter aviation. For the first time fighter jocks—not Pentagon experts or plane manufacturers—were setting performance standards for their flying machines. There were long debates into the night. New air maneuvers were invented, first with hands tracing loops in the air, then on the blackboard, and finally, the following morning, in the skies.

They started by flying F-4 Phantoms against F-8 Crusaders, the navy's last classic single-seater fighter, and then against Mongooses, stripped-down A-4 Skyhawks that made great MiG imitators. By the time the air war over Vietnam was resumed in early 1972 after two years of inaction, scores of Top Gun graduates were out on their carriers off the coast and MiGs were being shot down all over the place. The navy's kill ratio zoomed to twelve to one. But the final seal of approval on the Top Gun concept came on May 10, 1972, when two recent graduates, lieutenants Randall ("Randy") Cunningham and William P. ("Willy") Driscoll, blasted off the USS *Constellation* and headed toward Hanoi to escort an attack force over the Hai Dong railroad yards. It would turn out to be the hop to end all hops. Not just because they downed three MiGs in one day, but because those three took them over the magic five-kill line to make them the first official aces of the Vietnam War. As the navy flew Randy and Willy home to parade them across the country, the story of that little hangar at Miramar finally started getting out, and when the war drew to a close combat-

THE AGONY AND THE AGONY

The truth behind yanking and banking.

IF YOU SIT IN THE COCKPIT OF AN F-5 AND DROP YOUR hands to your sides, your fingers reach two metal bars lying flat along the base of the seat. The bars are painted in black and yellow stripes—a warning sign. Pull up and squeeze them and an explosive charge will blast you out of the cockpit and into the air, your seat will drop away, your parachute will open above, and you will float safely down to earth. That's how the ejection seat is supposed to work if anything goes wrong with the plane, but the trouble is you can't practice with it, only memorize a series of steps. "How many times have you punched out [ejected]?" asked Lieutenant Al ("Shoes") Mullen when I told him I wanted to run through it all again before our flight.

"Not once," I said.

"That's as many times as I've done it," he said, "and I don't plan to start now."

In a crazy sense, there was more reassurance in that fighter jock's swagger than in all the hours of safety training I had completed before going up in an F-5 (F-14s are classified—no civilians allowed) with Shoes as my pilot.

It was raining on the morning of our flight, but then the gray cloud cover broke, and taking off and flying through those fluffy white clumps was a near-sexual delight. It didn't last. As we flew over an Imperial Valley date farm and began dogfighting with Yogi and Possum in their F-14, my dispassionate observer mode was brutally shattered. It began as Yogi and Possum drifted away, vanished, then turned and headed back in our direction. Suddenly Shoes whipped the stick hard, first to the left and then to the right, and before I could catch my breath or brace myself he must have seen something, because he pushed the throttle and sent us into a sharp climb. It was my first introduction to the G forces.

When you are pulling Gs—withstanding several times the force of the earth's gravitational pull—the pressure comes from everywhere. Even your eyelids weigh several times what they normally do, and the pressure on your chest is so intense that you can hardly breathe. For the next half hour or so, I learned later, we went through several classic air moves, but all I remember is a series of flash impressions and a general feeling of physical torture. The things I thought would be the hardest to take, such as flying upside down, were anticlimactic. Indeed, at one point I remember seeing green fields where the sky ought to be, and it was sheer nirvana—after several minutes of pulling Gs and feeling the air pockets in my G-suit inflate against my legs to force the blood back to the heart, it was a relief to rest head down and let the blood return to my brain. And then, in an instant, we were climbing at 6.5 Gs, and I realized I was sitting slumped in my seat like a shriveled old man, a 1,100-pound old man, unable to straighten my back.

There were a lot of things I was unable to do. I couldn't pick up my camera from a nearby shelf—on earth it weighs about one and a half pounds. I couldn't slow the plane by pressing my feet forward as Shoes suddenly pointed the plane nose down and went into a dive. I couldn't keep track of Yogi and Possum's plane, streaking by like flashes of metallic light and nothing more. I had never felt so useless in all my life. I had lost control of everything that was happening from one second to the next, exactly the opposite of what fighter pilots feel—and must feel—all of the time.

And when I climbed out of the cockpit at the end of our hourlong flight, I couldn't even swagger. Every muscle in my body ached, I was exhausted and slightly nauseated, and all I wanted to do was go to sleep. But they tell me the first time is the worst, and I can't wait to get up there again.

—E.Y.

seasoned jocks scrambled to get there as instructors.

To truly appreciate what was happening at Top Gun in those heady years of the early 1970s, one must first understand that there are few caste systems as elaborate and demanding as the one military pilots live under. Its dividing lines are drawn like the circles around the bull's-eye of a gunnery target. On the outside is the mass of humanity that doesn't count at all—nonflying nonentities. In the outer ring, only slightly more significant, are the aviator's families, groupies, and hangers-on. Then come helicopter pilots, transport pilots, bomber pilots, and assorted prop-driven plane pilots, and next the attack pilots, whose planes have no afterburners and who charge at ground targets only. In the inner rings, where fighter pilots belong, there are finer distinctions that only the pilots themselves can discern, until one tiny circle is left at the center, the bull's-eye, where the elite of the fighter elite stand in glorious isolation. The greatest of the greats, the makers of legends—the "shit-hots."

At Top Gun, back in those postwar days, *everybody* was hot. So hot that the place sizzled even when nothing was happening. So hot that a lot of people suggested that even Randy Cunningham didn't truly belong there. Not that he wasn't a great fighter pilot. His three-MiG day was awesome, and in 1976 he and Willy Driscoll would actually be inducted into the base's Aviation Hall of Fame. But, though the young aviators at Miramar might be content to gape at Cunningham's two silver stars and Navy Cross, to the Top Gun hotshots his new MIG ACE license plate was, well, unprofessional. "Really great fighter pilots are like the great gunfighters in the Old West," says Jim ("Hawkeye") Laing, one of the original Top Gun hotshots. "They didn't have to tell anybody how great they were—all they had to do was just stand there, and the aura was such that everybody knew. It's the same here. *Everybody knows.*"

Not that anybody was just standing around at Top Gun. There were the drinking sessions at Bully's, a steak house in San Diego, and the late-night car races in Imperial Valley, running through sleepy little towns at 100 miles an hour with no headlights. "It's all right, officer, we're from California," a tanked-up marine hotshot once told a cop who had stopped him. "This *is* California," the cop answered, and wrote him up. But most of all there was flying. Glorious flying. The greatest fighter flying in the world was taking place every day over Yuma, Arizona, or the Chocolate Mountains or the Pacific Ocean as Top Gun's Vietnam vets set out to rewrite every single fighter aviation text ever written.

Yet this fighter pilot's Valhalla almost came to an end in late 1977, when Rear Admiral Frederick ("Field Day Fred") Fellows assumed command of Naval Air Station Miramar and set out to restore discipline and naval decorum to the fighter community. Suddenly the old peacetime regulations were being enforced, and before long the hotshots began to leave. Top Gun's dark ages lasted until the spring of 1979, when Fellows was replaced by Rear Admiral Paul ("Gator") Gillcrist. Unlike his predecessor, Gillcrist was a fighter pilot's pilot—he had flown the F-8 Crusader in the early years of the Vietnam War. A sigh of relief swept the fighter jock community, but by then so many of the original hotshots had left that hardly anybody with any war experience was available for a Top Gun instruction post.

By the time Yogi and Possum walked over from the south end of Hangar One, home of VF-1 Wolfpack, to the north end to begin their Top Gun training last January, only the course chief, Commander Ernie ("Ratchet") Christensen, and one or two instructors could speak with the authority of actual combat experience. But it was still shaping fighter aviation doctrines and tactics, and it was still the greatest fighter-pilot school in the world.

IT STARTED SLOWLY, GENTLY. There were lectures and briefings, but soon Yogi and Possum were up in the air, and there was more flying than they had ever had. There were one-versus-one hops (one student crew against one instructor), then two-versus-two hops, and then came the tough two-versus-unknown hop, in which two student crews take off not knowing how many bogeys are waiting out there or where they'll come from or in what order. That's how Yogi and Possum happened to be flying off the coast of Ensenada on that bright January morning, just floating through the blue looking for game, when that F-5 rolled in and sent them home with a simulated Atoll shot. Before long the hops were running into each other, and Yogi and Possum noticed that something was happening to them. They were flying twice a day—not cross-country cruising but edge-of-the-seat, hard flying, intense, mind-bending flying—and they didn't even have to speak except to draw attention to a bogey. They were being hammered into a team.

And so it was that on a sunny day last February Yogi and Possum strolled out of Hangar One in their flight suits, with their helmets and oxygen masks dangling from their arms and their

chutes slung macho-casual over their shoulders. Their plane was ready and waiting, and as they climbed into the cockpit nobody came running up to say that the hop would be delayed. That was a good sign right there. And then the little huffer cart blew air into the engines to get them going, and in seconds their machine was humming like a rocket. They taxied out to the runway, lined up, and blasted off, and still everything was okay. They banked right and leveled off at 2,000 feet, then climbed higher and headed for the rugged Mojave Desert country around China Lake for the most important Top Gun hop, the culmination of their training. It was a great beginning for a great hop.

Once over China Lake they teamed up with a few A-7 attack planes, which they escorted over "enemy" land on a bombing mission. The A-7s did the bombing, and Yogi and Possum and the rest of the F-14s went along on a MiG sweep, looking for bogeys and fighting their way to and from the target area, taking care not only of their own tails but of those nose-down A-7s below. Since this was "enemy" territory, and the Russians were big on radar control, they flew in low, hugging the terrain at 500 feet.

Yogi and Possum were zipping along, shooting up mountains and down canyons and flying so low that it was hard to keep from staring at the ground, but they had to keep looking for bogeys. Only a few days earlier they had been out there over China Lake, just coming out of a mission, when they turned back and saw two bogeys riding their tail. Yogi watched the one on the left and Possum tried to keep the one on the right in sight, but then Yogi found out that his bogey had just fired a missile. There are a couple of things a pilot can do with a heat-seeking missile heading his way, and one of those is to break hard—pull away fast—to foul up the missile's tracking system. Possum was losing his bogey and was just turning his head to look over his right shoulder when suddenly Yogi pulled the stick and headed up in a 7.5-G climb. As Possum fought to keep his face from smashing into the radarscope he heard his neck begin to pop, the vertebrae cracking the way knuckles do when pulled—"puk, puk, puk." That's when Yogi said real cool into the mike, "Hey, you still got those guys back there?" Possum couldn't even look up to ask him if he was kidding or what.

So now they were shooting up and down those brown and yellow desert hills, and they still had to keep an eye peeled on that huge blue dome above them. But nothing happened. They saw a few bogeys in the distance, but nothing to worry about, and they came over the target area and turned around and headed back, and still nothing. They would have preferred a little more action, when you came right down to it, but what really mattered was that they had been ready for it all along—they could have fought their way out of anything. They had made it into bogey country and hadn't screwed up once.

Yogi and Possum finished the Top Gun course at the end of February. As their class picture went up in the briefing room and they received their new Top Gun flight jacket patches (a MiG caught in a fighter's cross hairs), the news came that the Wolfpack was named top fighter squadron on the West Coast—one of only two contenders for the Admiral Clifton Award, the navy's greatest tribute to a fighter squadron. Two weeks later the men of the Wolfpack began flying out to land on the pitching and rolling flight deck of the USS *Kitty Hawk*, some 100 miles out to sea off San Diego, in preparation for their next cruise. This time Yogi and Possum would lead those long fighter patrols over the Indian Ocean, and out there over their wing would be a young pilot just out of training, eager to learn how to be a real fighter pilot. ■

Exhibit B

Yonay v. Paramount Pictures Corporation

Case No. 2:22-CV-3846-PA-GJS

(C.D. Cal.), Dkt. 20

Top Gun: Maverick DVD

Lodged Concurrently Herewith

Exhibit C

NO MARGIN FOR ERROR

THE MAKING OF THE ISRAELI AIR FORCE

EHUD YONAY

Library of Congress Cataloging-in-Publication Data

Yonay, Ehud.
No margin for error : the making of the Israeli Air Force / Ehud Yonay.
p. cm.
Includes index.
ISBN 0-679-41563-7
1. Israel. Hel ha-avir—History. I. Title.
UG635.I75Y66 1992
358.4'0095694—dc20

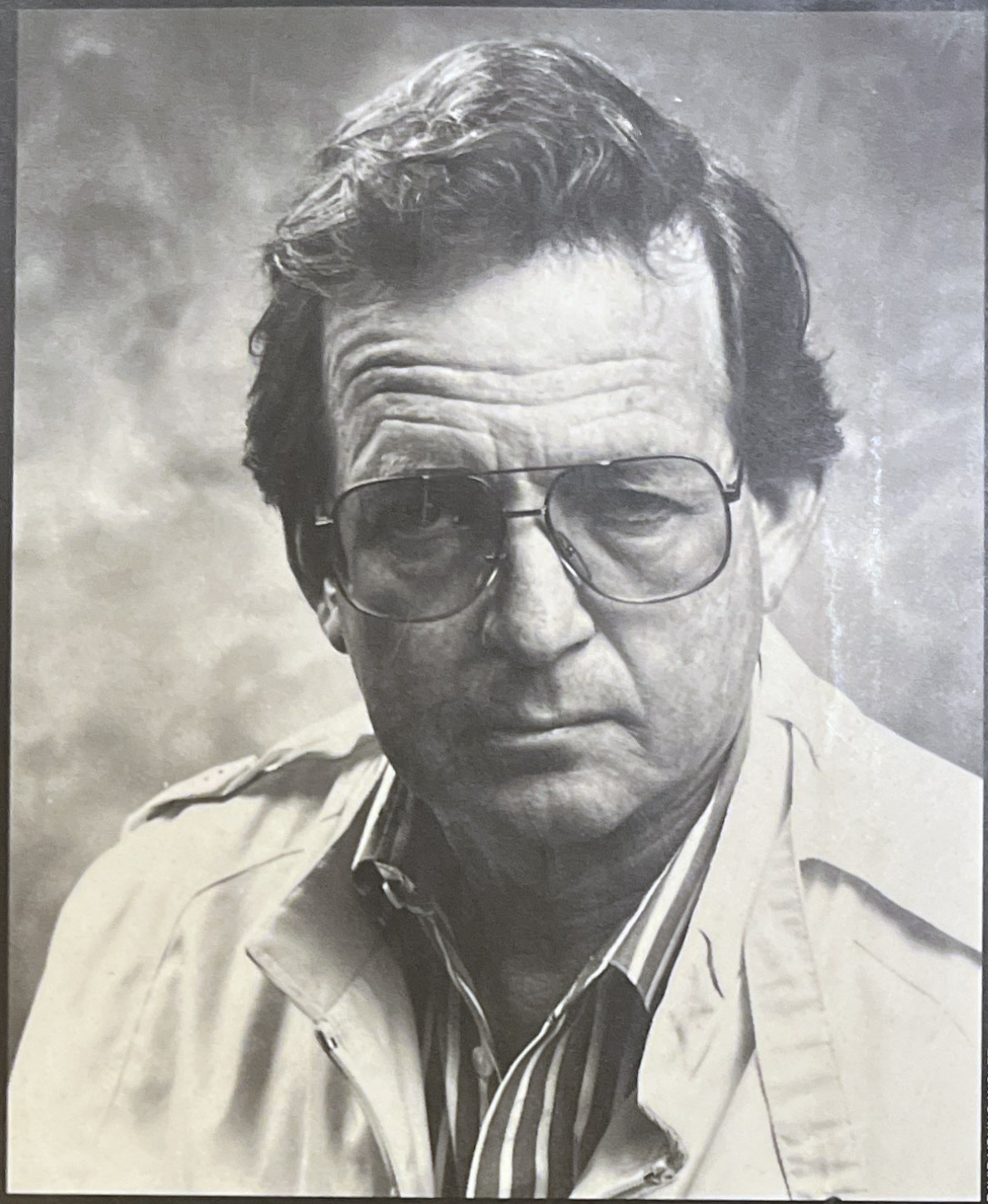
92-54112

Book design by Judy Christensen

Maps by Eric Elias

Manufactured in the United States of America

First Edition



DAVID YOUNG-WOLFF

Israeli-born Ehud Yonay is an award-winning West Coast investigative reporter, whose story of U.S. Navy fighters, "Top Guns," was made into the movie *Top Gun*. He divides his time between his West Coast residence and his family olive farm in northern Israel.

52750

9 780679 415633

ISBN 0-679-41563-7

Exhibit D

DATE: April 29, 1983

TO: Ehud Yonay

California MAGAZINE

This is a letter of agreement between you and CALIFORNIA Magazine, Inc. regarding the following assignment for CALIFORNIA Magazine. Please read the letter carefully, sign where indicated, and return one copy. If you have any questions, do not hesitate to call us--but remember that we will be unable to pay you until we have received our signed copy.

By signing this letter of agreement, you enter into a contract with CALIFORNIA Magazine, Inc. on the following terms:

ARTICLE: - - - - - - - - -MIRAMAR- - - - - - - - - - - - - - **LENGTH:** TBD

FEE: -

DEADLINE: N/A **KILL FEE:** **EXPENSES:**

(1) In exchange for the fee, you agree to give CALIFORNIA all periodical rights in the article, including First North American Serial Rights, and the non-exclusive right to reprint the article in an anthology. CALIFORNIA agrees to pay you an additional fee to be determined at the time of publication if your article is used in an anthology. CALIFORNIA also agrees to pay you two-thirds of all income received by the magazine if we re-sell your article to another publication. (This means CALIFORNIA will seek to re-publish your article in other periodicals, but you will receive two-thirds of the proceeds. This also means that if CALIFORNIA publishes an anthology of CALIFORNIA stories, we can include your article. If we do so, you will receive a proportional share of the standard writer's royalty. Finally, CALIFORNIA will give you the right to include your story in other anthologies, and you will keep the right to sell a derivative work based on your article, such as a book or a screenplay.)

(2) You agree that you will be the sole author of the article and that it will be an original work that has not appeared in print in any other publication. (This will avoid any conflict over rights prior to publication in CALIFORNIA.)

(3) You agree to use all reasonable care in reporting and writing the article to make sure that it is factual and accurate, that it is not obscene, that it does not defame or invade the privacy of any person, and that it does not infringe the copyright of any person or business. (This means that you will be careful to follow the standards and practices of good journalism, and thus it helps to protect you and CALIFORNIA from lawsuits.)

(4) You agree to keep all notes, tape recordings, documents, and other working papers used in reporting and writing the article for a period of two years. You also agree to notify CALIFORNIA immediately if you learn of a lawsuit regarding your article, and you agree to cooperate with CALIFORNIA if a lawsuit is filed. (This means you will make yourself and your materials available to our attorneys and will cooperate with them if we are sued.)

(5) You agree that the editors of CALIFORNIA will have the right to edit your article and to decide if and when it will be published. (This means that when we accept and pay for the article, we have the right to decide how it will be used in CALIFORNIA.)

For CALIFORNIA Magazine, Inc.
Post Office Box 69990
Los Angeles, California 90069
Tel: (213) 273-7516

BY: [signature]
Scott Kaufer, Editor

AUTHOR: [signature]

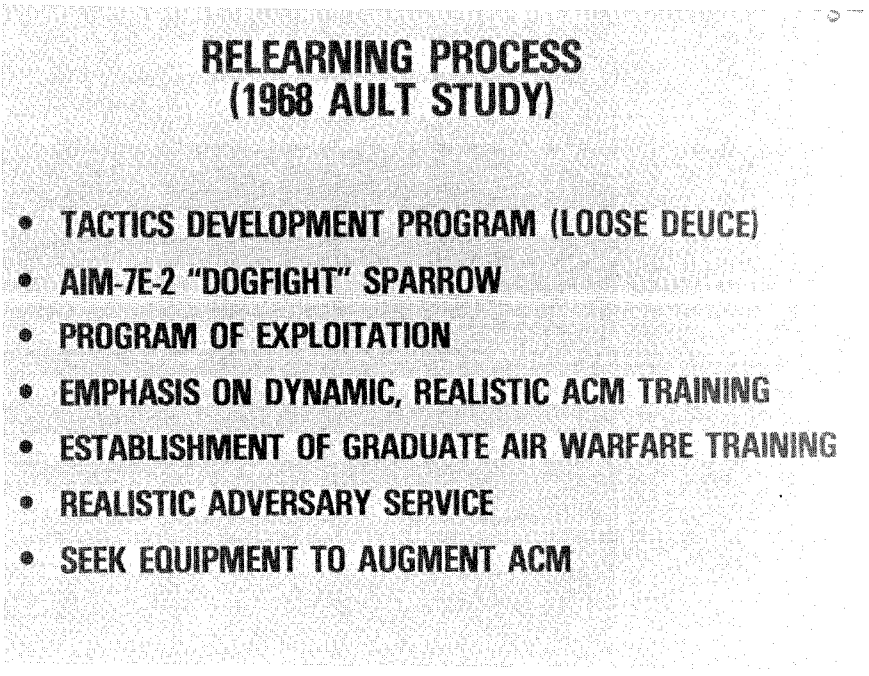
SOC. SEC. #: 558-64-0354

Exhibit E

TOPGUN PROGRAM UPDATE

Commander READY. Mr. Chairman, members of the committee, I an Commander Jack Ready, commanding officer of the Navy Fighter Weapons School. I think I have the best job in the Navy. I would like to give you the operator's view of how we conduct our training and what we would like to see in our aircraft and our approach to the dogfight or the fighter mission at the U.S. Navy Fighter Weapons School, Topgun. Last year the commanding officer of the Fighter Weapons School spoke about the history or philosophies and the whole air warfare training concept that we now have in the Navy. Basically what was said, was that in Southeast Asia we had an aircraft that was not optimized for a dogfight. When this airplane was designed, we thought at the time maybe dogfights were not a good way to go. However, we found ourselves in the Vietnam arena where we had to be eyeball to eyeball with the enemy. He could outfly us, so to speak. He was more agile.

We also had missile systems that were not optimized for the dogfight arena, and I kind of equate it to being in a phone booth with a rifle trying to fight a midget with a knife, and that is exactly what we found here.



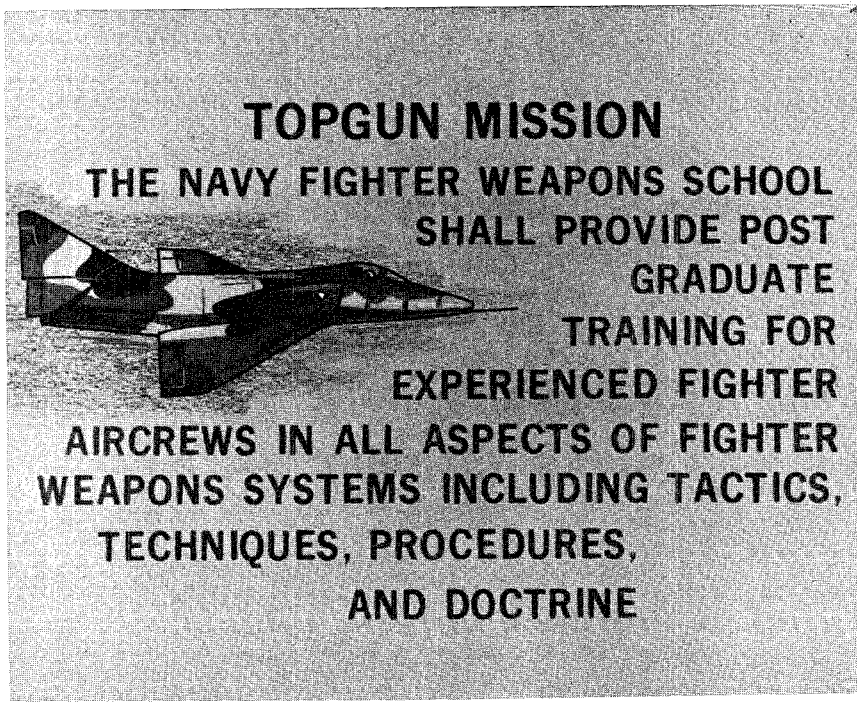
So we had to do something about it. Our kill ratio was sobering. It was on the order of [deleted]. We had a study in 1968—and these are some of the things we did to overcome the deficiencies of the F–4. We had a package development program. We developed Loose Deuce, a very sophisticated tactical concept. It is basically a two-ship forma-

tion that takes an intense amount of training to do it properly. We developed the Dogfight Sparrow, and this gave us a closer range capability, and we also developed the Advanced AIM–9 missiles which helped us. We had a program of exploitation here. We got a chance to look at the vehicles, to truly test our effectiveness, and develop this Loose Deuce tactic.

We put a lot of emphasis on a dynamic, realistic ACM training. We still do that today. We think that no matter where we go, we are going to end up in the dogfight area, and we are going to have to be able to do it and win.

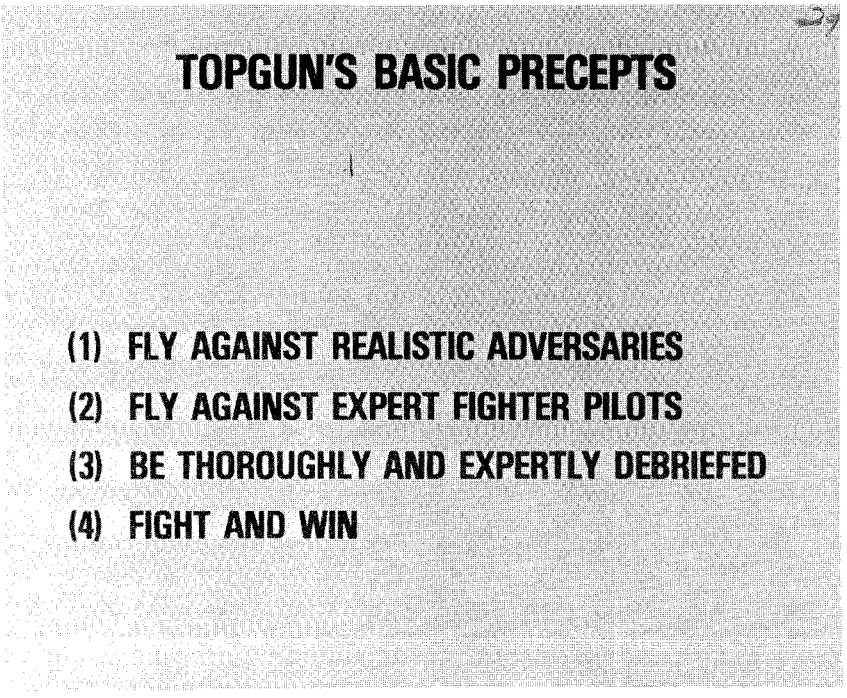
We established Navy Fighter Weapons School in September 1969. Our concept at that time was to make an individual out of each fleet squadron an air expert, send him back to the squadron, and allow him to train his fellow mates, and also advise his commanding officer on how best to train for this air warfare mission.

The realistic adversary service is a must. We must have aircraft that can closely simulate the threat. This business is so dynamic and intense that we have to have an aircraft that is very close to the enemy so you can optimize your machine in defeating him. We are always seeking equipment to heighten and augment our capability in ACM. We have systems today like the visual target acquisition system, pilot lock on modes, quick lock up, that help us in this dogfight arena. From 1965 to 1968, you can see our kill ratio was quite poor. We started this concept, in 1969, this new way of thinking and in 1972 we got that kill ratio up to [deleted] and we are very proud of that record. Significantly, our kill per engagement ratio was about [deleted] this was significant. In other words, [deleted].



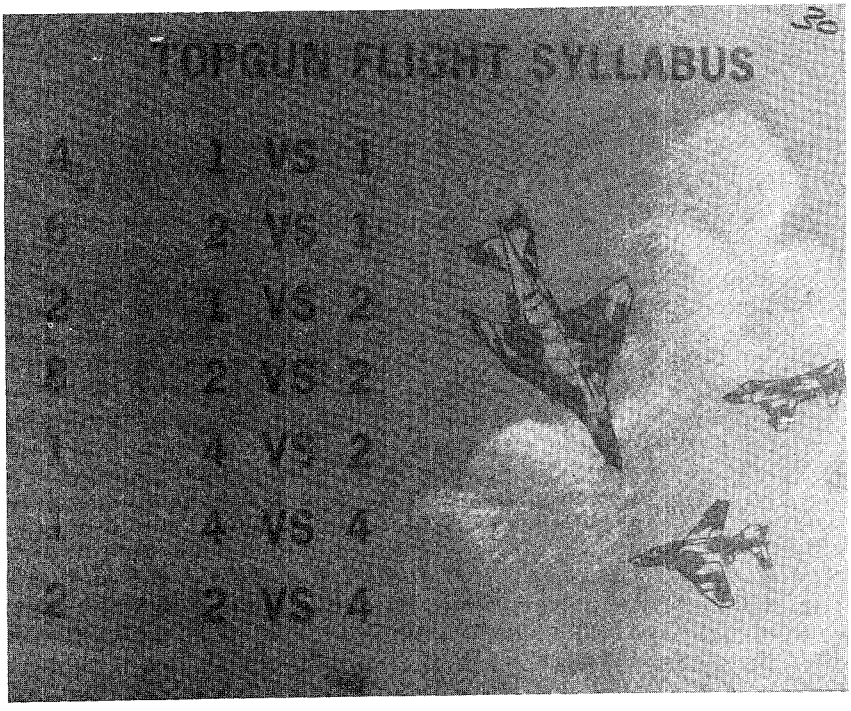
This is the way the mission at the fighter school is written. It is a postgraduate training evolution. We are involved not only in training graduate students in air warfare, we have a very close rapport with the T. & E. and O.T. & E. communities in developing tactics, and in making comments on systems that will help us.

This is the way I like to view our mission, and we are studying this problem from head on all the way down to dead 6 o'clock, and this is generally where it ends up.



Our basic precept at Fighter Weapons School, is that you have to fly against realistic adversaries. It is counterproductive, I think, to go out and fight an aircraft that you are probably not going to have to fight in combat. You can build bad habits doing that. You must fly against a Red Baron. We put the best fighter pilots we can find in the Navy in Topgun, and they aggressively go out and train other airmen to defeat them. We feel if our fighter community can defeat us, we have accomplished our mission.

Being thoroughly and expertly debriefed, this has always been a problem. The air combat arena is so dynamic that generally when you come back you remember about the first 30 seconds and the last 30 seconds, and it is very, very difficult to reconstruct what you did and to learn from your mistakes. Thus, we have the Air Combat Maneuvering Range, and I will show you a sample of this in a minute on this videotape. With this training device you can see exactly what you did, and we spend an awful lot of effort debriefing. This is where we think most of the learning occurs. And of course, we always preach fight and win.



The whole school revolves around the flight syllabus. It is very dynamic. We start the jets off initially one versus one. We put them in a dogfight arena. In the case of the F–4, we show the guy the degree to which he cannot defeat small, agile airplanes in close. He has got to use proper tactics. In the case of the F–14, we show them the degree to which in fact they can defeat these aircraft in close dogfights. We also calibrate eyeballs. This is very important.

When we get into the two on one arena, this is our basic Loose Deuce. Here, we are trying to develop teamwork and coordination in getting the air crews to work together, getting the front and the back seat in the aircraft working together.

In looking at the one versus two, we feel that in the future this is our most likely situation—we are going to be numerically inferior. Here we put the F–4 in this environment and we teach them at least how to survive. In the case of the F–14, we put them in that arena, we show him his capability, and again I will show you the F–14 fighting two small, agile Tigers, and he gets them both.

Then we get into the advanced missions, getting air crews used to fighting with large numbers, and that is what the real world is probably going to be. We introduced what we called wild cards during these flights. These are unannounced threats that come into the fight and we see if the fighter crews can pick them up and handle the situation. It is a very dynamic syllabus. We are very proud of it, and some of the evaluations that are going on in the future are using this type of a syllabus for an air combat evaluation.

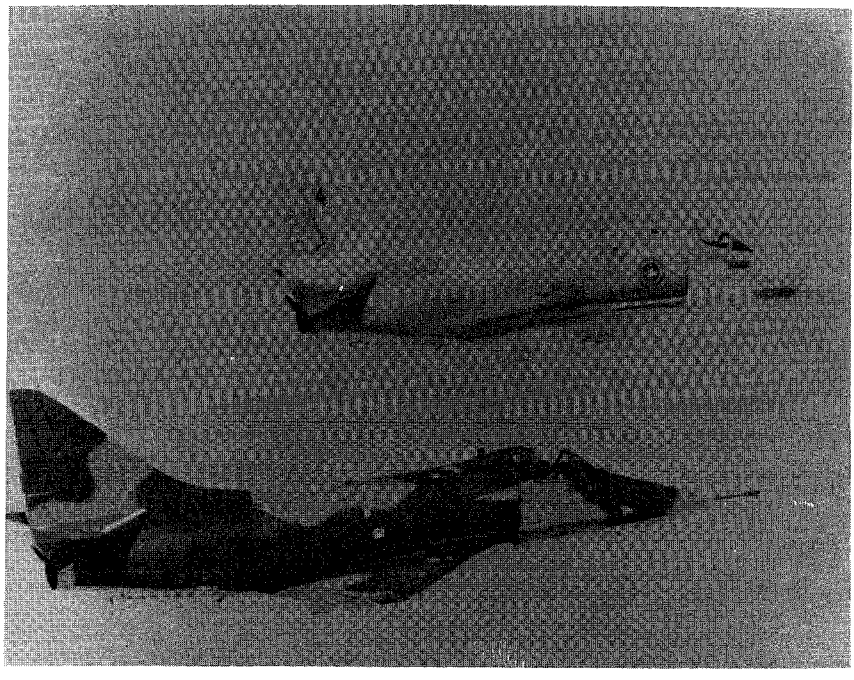
Our ground school, we try to keep it flexible and current. We work very closely with the intelligence community. We teach—we try to

teach this gent how to go back to the squadron, and teaching ACM warfare is extremely difficult. We spend a lot of time with that.

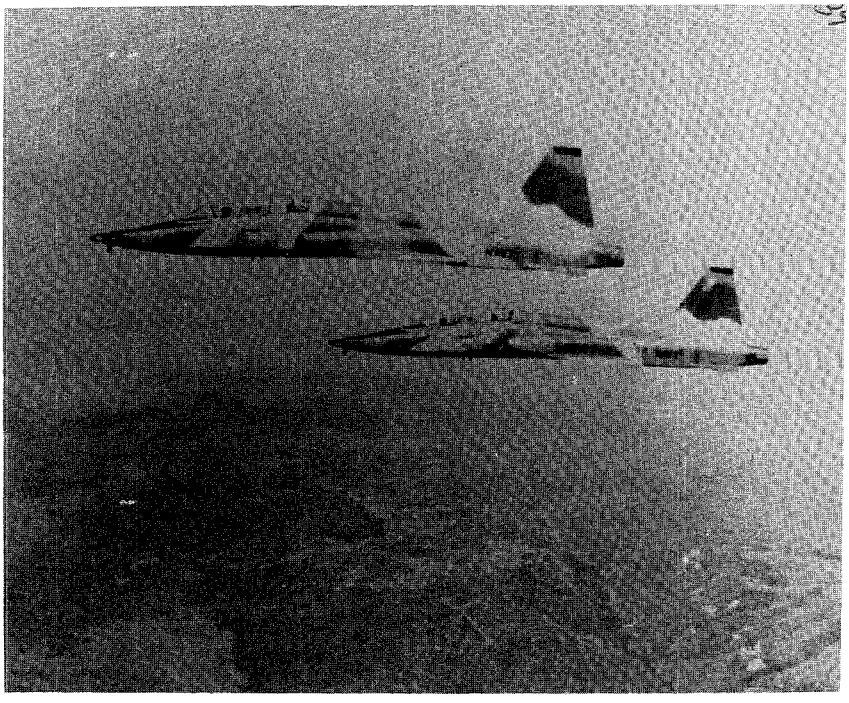
We are also looking at the Middle East environment. [Deleted.]

Our responsibilities are numerous. The course is basic bread and butter. We run a fleet adversary program which we consider this extremely important. When the squadrons come back off the ship and they go through their shore based training cycle at Miramar or at Oceana, all are serviced with our adversary aircraft and also with their inflight and ground instruction, if they would like it.

We do air combat maneuvering exercises, and we actually grade these. The commanding officers of the unit can see how effective his unit is before getting under way. We will grade them in the dogfight in the air. We will run operational readiness exercises. The ships will be off the coast, embarked, getting ready to go on cruise. We will set up the fleet air defense posture and will go out and try to penetrate it and shoot down the fighter aircraft. We also grade those exercises.

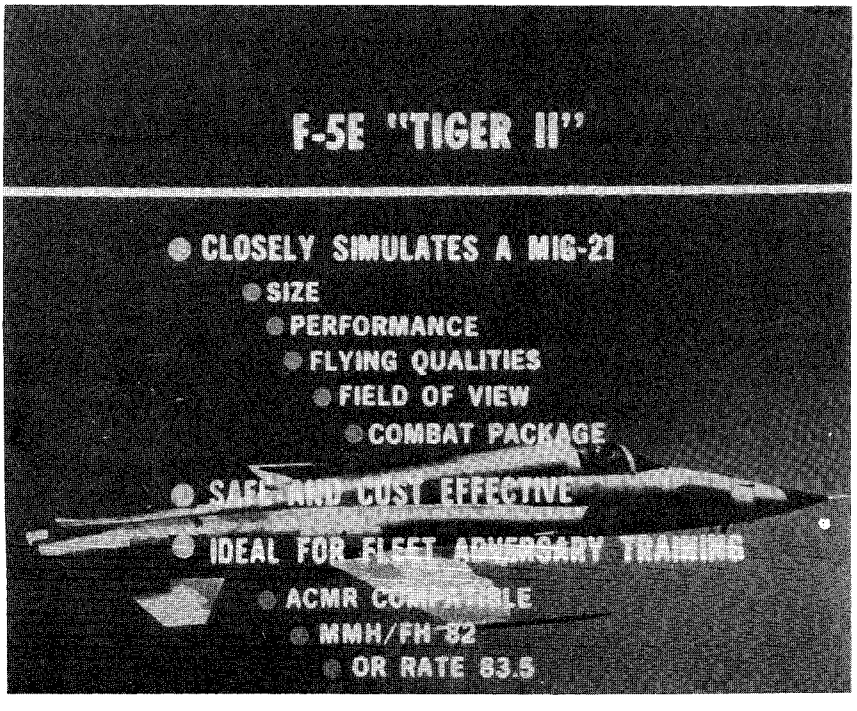


These are our assets. This is the nonstandard A–4. We call it the Mongoose. It is small and agile. We have done a few things to it to even make it more effective. We have taken all the weight out of it that we do not need. It is essentially an engine and a shell with a radio in it. It has a decent thrust to weight ratio. It is pretty high, about .8. We think of it as our [deleted]. It is not a perfect simulation, but it serves our needs.

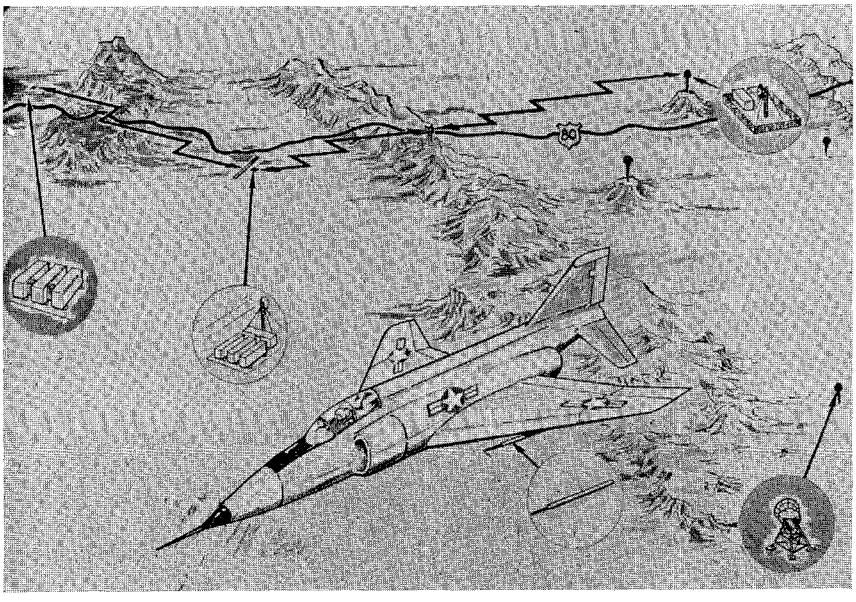


We use T–38s. The T–38 simulates the [deleted] in the high subsonic area. We need these aircraft at the Fighter Weapons School because they have two seats. We in the Navy teach fighter crews, front and back seat. We believe in matching these crews and keeping them together. We have radar intercept operators on our staff with the pilots, and they have a need to go out and instruct in the air along with us.

We think it is a very important thing, and we are very happy with the T–38. We are extremely happy with the F–5. We received three in September and the other two in February. It is a tremendous deal for us. It has got a lot of things that we need [deleted]. It can carry the POD's for the air combat maneuvering range. It also has a gun system in it that we on the staff can use.

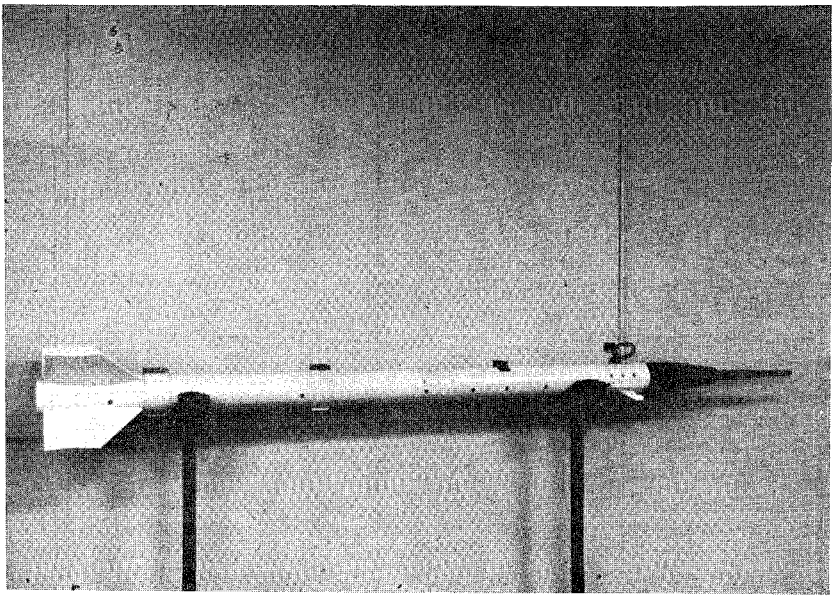

F-5E "TIGER II"
CLOSELY SIMULATES A MIG-21
SIZE
PERFORMANCE
FLYING QUALITIES
FIELD OF VIEW
COMBAT PACKAGE
SAFE AND COST EFFECTIVE
IDEAL FOR FLEET ADVERSARY TRAINING
ACMR COMPATIBLE
MMH/FH 82
OR RATE 83.5

The F–5 [deleted]. This airplane is really opening a lot of eyes in the fighter community. They cannot believe it can do so well. And it has really given the pilots a [deleted]. It is a very safe airplane. There are no adverse flying qualities with it, and we have not departed or spun one yet. It is ideal for our use because not only [deleted] but it has an operational ready rate of about 83 percent; at least that is what we have in the Navy. Our maintenance man-hours per flight-hour are 8.2, very low.



We run various color schemes on our aircraft. There is no single answer. We fly over the water, as well as, over the land type flights. Mainly this is an exposure thing to the air crew, so they can see what different colors look like against different backgrounds.

The air combat maneuvering range is a system where we can get total recall on what happens in dogfights in the air arena. We essentially take a POD that is similar to the AIM–9 and hang it on the aircraft with no modification. The system picks all the data up from the POD, puts it through a computer, and gives us a display. We will show you the display in a minute.



ACMR WILL PROVIDE

AIRBORNE INSTRUCTION

PERMANENT RECORD OF ACM

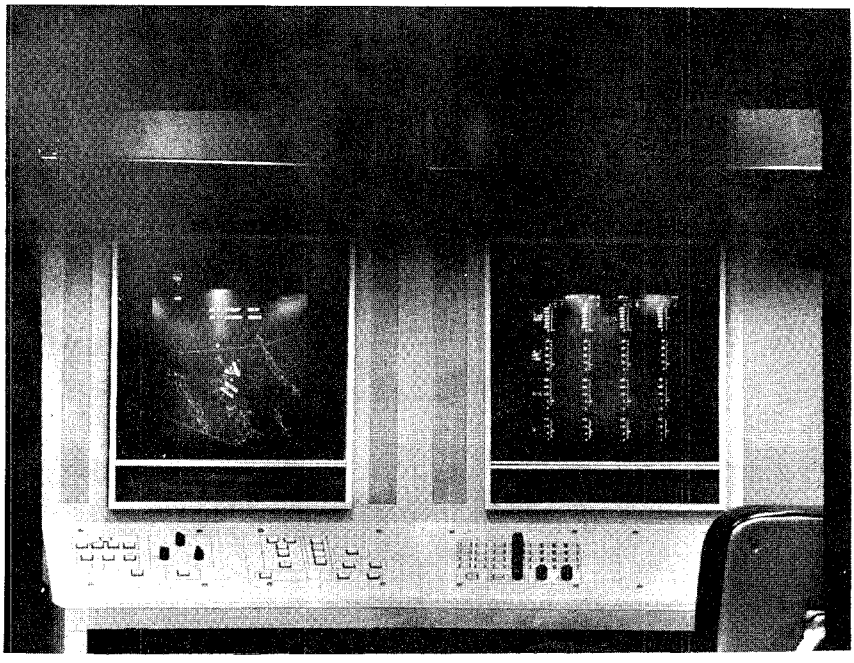
SAFETY FACTOR UNDER REALISTIC CONDITIONS

REAL TIME ASSESSMENT OF FIRING ENVELOPES

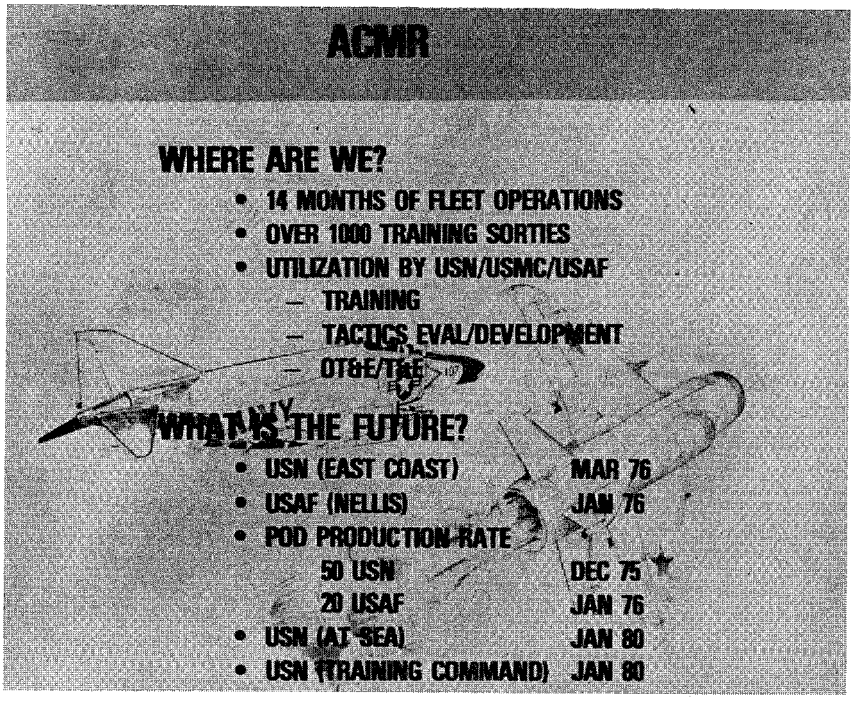
The air combat maneuvering range enables us to instruct while the gent is airborne. We have an instructor pilot on the ground monitoring exactly what he is doing, and he can call the shots if he so desires. It gives us a permanent record of what happens, total recall. We like it from the safety factor also that we can monitor things like altitude, speed, angle of attack, and G, and see if the guy has a tendency to exceed limitations or violate rules of engagement.

It also gives us a real time assessment of firing envelopes. We can very, very accurately tell if he was in fact within an envelope, and then hopefully we can train him not to waste a missile.

[A videotape presentation was shown.]



These are TV type displays. The one on the left is a two dimensional picture of the actual fight, and the one on the right is an alpha numeric readout of all the performance parameters. We can measure just about anything.



We have used the system now for 14 months. We have had well over 1,000 training sorties. The reason that it has not gone higher is that we are only operating with three of the POD's. The Navy, the Marine Corps, and the Air Force have utilized the system not only for training, but for tactics development. It has tremendous usefulness for tactics development and for the operational test community.

In the future we hope to see the system on the east coast in March of next year. The Air Force plans a system at Nellis in January of 1976. We should have 50 POD's by December of this year. So the utilization will really increase then.

I would like to see this system at sea, if possible, sometime in the 1980's, and the training command also has expressed a desire to have it. It is a tremendous system and we are extremely happy with it.

The F–14 joined our force last month. We have found that this airplane is a superb dogfighter. It is a superb aircraft to use in a strike escort role, and it is also a superb aircraft in the fleet air defense role for defending our ships and sea lanes.

We have run several exercises with this airplane, escorting strike aircraft, and we have had as many as 12 adversary aircraft out there trying to shoot down the strike group, and with two F–14's escorting this group, both times they picked up every adversary aircraft by 50 miles, had them all designated and had the complete tactical picture. Once we get engaged, this airplane is a very agile machine, and if well flown, can easily defeat the F–5 or the A–4.

I would like now to show you an example of this. This was flown on the air combat maneuvering range, and is an actual training sortie.

I would like to show you a one versus one flight of the F–14 fighting the F–5 in a close-in dogfight, and then I will show you a one versus two, the F–14 fighting two A–4's. The pilots of the adversary aircraft are Topgun instructors. The pilot of the F–14 is from a readiness squadron, VF–124, at Miramar.

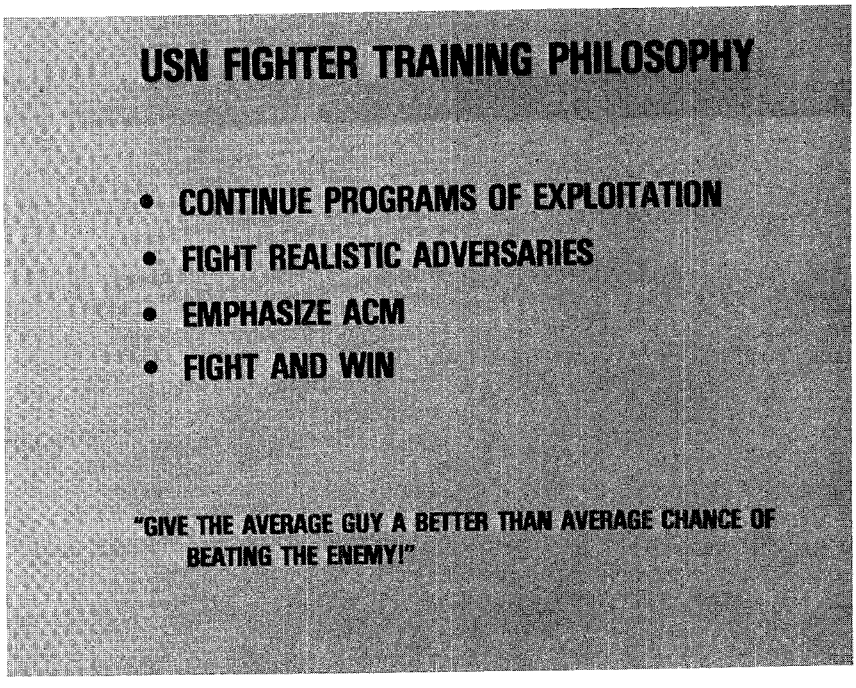
What you will see is the range. It is a God's eye view. You are looking down on the fight. We can tilt it in any manner.

[A film was shown.]

NARRATION OF ACMR VIDEOTAPE

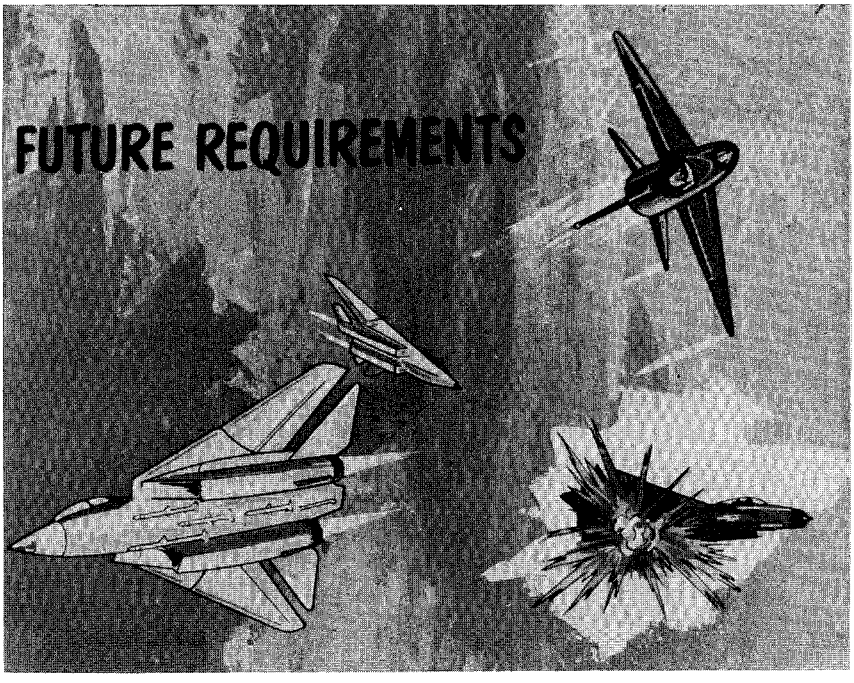
Commander READY. We are emphasizing the time to kill of this aircraft. It has a good capability against multibogies. Both A–4's were as aggressively flown as they could possibly be by Topgun instructors. They were out there trying to fight and win also.

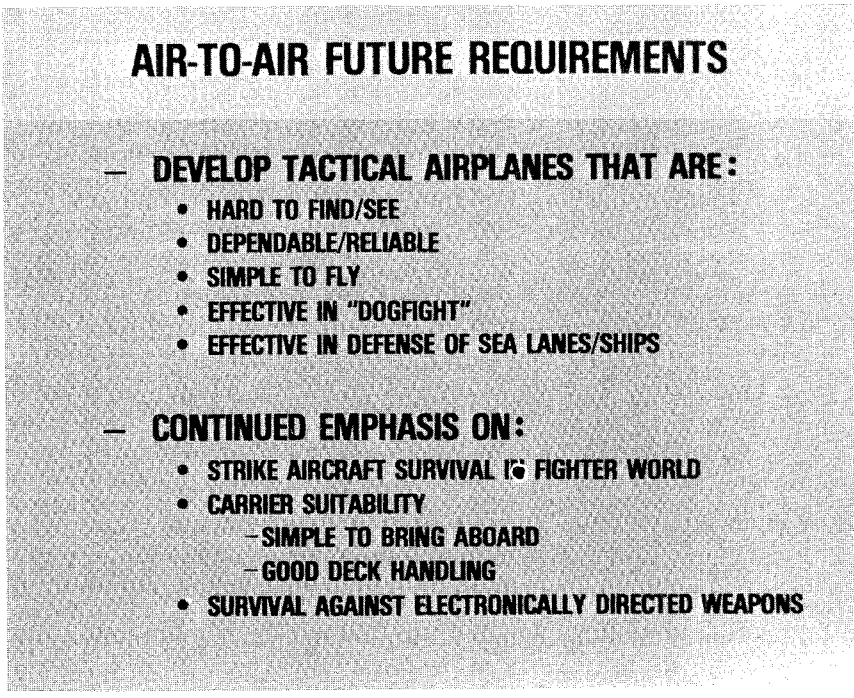
Senator GOLDWATER. It did not look like it.



Commander READY. The quickness of the kills by the F–14 makes it look easy. Our philosophy at the fighter weapons school and throughout the Navy is the same today as it was last year. We want to see our programs of exploitation continue. We learn an awful lot from those programs, both in developing tactics and exposing aircrews to enemy vehicles. As much as we can we want realistic adversaries. The F–5 has done a lot for us and we are very pleased with it. We now have a high degree of confidence [deleted]. [Deleted.]

We are constantly emphasizing air combat maneuvering. I equate this with playing the piano. You learn the basics, you develop the melody, and you have to do it almost daily to stay proficient at it. It is a very dynamic environment to be in and one that takes a very talented gent to do effectively, and o course, we are always preaching fight and win. We like to look at it as giving the average pilot a better than average chance of beating the enemy. With our training concept we feel that we can do that.





We, as operators, would like to see in future aircraft and in fighters, airplanes that are hard to see, hard to find, aircraft that are dependable and simple to fly. In the case of the F–4 we have flying qualities that precluded pilots from obtaining its full envelope or its full performance, and we cannot tolerate that in air warfare. It should be effective in dogfights and it also should be effective in a fleet air defense role.

I would like to see continued emphasis on strike aircraft surviving in the fighter world also, giving them a capability to at least survive. It should be easier to get aboard the carrier and of course, survive against electronically directed weapons.

Gentlemen, in conclusion I would like to read a quote from Adolph Galland. He was commander of the fighter forces, Luftwaffe. He said, "Only the spirit of attack born in a brave heart will bring success to any fighter aircraft, no matter how highly developed it may be." And I think he was saying the same thing that we are saying today. There is nothing magic in any machine. It is still a matter of training, and this is our view at the fighter weapons school. We in the Navy believe we have good fighter aircraft, a good dogfighter in the F–14. The F–4 still has its limitations in turn. I would certainly like to see slats on our F–4's. I think that would give us a much needed capability, especially in light of the threat which probably is going to be [deleted].

Thank you very much, gentlemen.

Senator GOLDWATER. Could I ask a question?

Senator CANNON. Certainly.

GROUND DOGFIGHT SIMULATORS

Senator GOLDWATER. Have you any ground trainers in which you can stimulate the same type of fighting? I saw one at McDonnell a few years ago, and I am wondering if you ever did anything with that. We are about to contract for an air combat maneuvering simulator.

Commander READY. Yes, sir. Northrop and McDonnell Douglas among other companies have been running R. & D. simulators, and we are on the ground floor with the operational test community looking at these simulators. We would sure like to have one. As a matter of fact, we would like to be able to take it into the air combat maneuvering range and use it where the pilot could actually correct his mistakes by going from what he did into the simulator and back.

Our view on simulators is they really reinforce what the pilot can do in the air, and we would certainly like to see an air combat simulator.

Senator GOLDWATER. Have you looked at the Northrop simulator?

Commander READY. Yes, sir, at the moving base one. I looked at that. I have not personally flown it, but I have looked at it. I intend to fly it in the near future.

Senator GOLDWATER. I think it is a great adjunct to what you are doing, and I think what you are doing is long overdue.

Commander READY. Yes, sir.

F–5E'S AT TOPGUN

Senator CANNON. Do you have five of the F–5E's, now?

Commander READY. Yes, sir, at this time we have five.

Senator CANNON. And are you programed to get any more, or is that the length of it for right now?

Commander READY. Yes, sir, I hope we are going to get more, and I would like to see them on the east coast as well as the west coast.

Senator CANNON. Admiral Houser? What do you say?

Admiral HOUSER. Yes, sir, we are trying to get some F–5E's from the Air Force, some of those that were assigned to the Air Force which formerly were going to the Republic of South Vietnam. I have talked to one of the generals in the Air Force to alert him to our requirements, and we have prepared a request from our Secretary to theirs. We hope to have detachments of F–5E's not only on the west coast but the east coast as well.

Senator CANNON. Where would you conduct this type of program on the east coast?

Admiral HOUSER. We are establishing the air combat maneuvering range off the Outer Banks of North Carolina, and it would be in this location that we would do the training. We were going to have it over the Great Dismal Swamp, but we had a number of precautionary complaints that the range would be too noisy and the local residents did not want airplanes flying overhead. We have no reason to think that we will not be successful in putting the range offshore. This range will be used by the Navy, the Marines, and also the Air Force.

USE OF SPARROW AS DOGFIGHT MISSILE

Senator CANNON. How much use are you getting out of the Sparrow in the Dogfight mode out of the F–14?

Commander READY. We are making increasing use of the Sparrow, since Sparrow solutions and shot opportunities occur, more frequently in the F–14. It takes additional training to use it, and we are stressing its use particulary head-on, where the Sparrow is optimum. We need both that and the heat seeking missile and the gun. The F–14 has all three.

EXCHANGES WITH AGGRESOR SQUADRON

Senator CANNON. Have you conducted any operations with the Air Force squadron out of Nellis?

Commander READY. Yes, sir. We are very close with them. Periodically we exchange ideas, and have seminars. They come down, visit us, and explain what they do, as we do with them.

TOPGUN FIGHTS AGAINST F–15

Senator CANNON. Have you flown any of these missions against the F–15?

Commander READY. Yes, sir.

Senator CANNON. Tell us about it?

Commander READY. I flew the F–5 against the F–15. The F–15 is a very formidable airplane. It is a very good dogfighting airplane, also. Initially, they had to get used to the airplane, develop tactics for it. As of late, I think they have developed good tactics, and it is a very impressive aircraft. I would sure hate to be in the same sky with it fighting it in an F–5. It is a tough airplane.

RANGE OF MISSILES AND GUNS

Senator GOLDWATER. In pursuit, what is your closest possible range with the Sparrow?

Commander READY. The closest range actually could be [deleted] and then of course the gun right down to, a very close range.

Senator GOLDWATER. What are you taking now as your maximum effective range of the gun?

Commander READY. 1,500 feet. You could probably fire it at 2,000, but your kill probability would not be quite as high. We are teaching the pilots to recognize and get into 1,200 to 1,500 feet.

Senator GOLDWATER. Is that your 20 millimeter?

Commander READY. Yes, sir. Of course, the F–14 has an excellent heads-up display system for gun firing.

Senator GOLDWATER. That F–5 is a great airplane. I flew it against a slot wing F–4.

Commander READY. Yes, sir.

Senator CANNON. Thank you very much, Commander Ready.

PREPARED QUESTIONS FROM SENATOR CANNON

Admiral, we have some question on force structure that we will submit to you and let you supply answers for the record. Unless Senator Goldwater and Senator Hart have questions for you, I think we will go on to the F–14.

Senator GOLDWATER. I have some but we can wait on them.

Admiral HOUSER. We will be pleased to furnish those answers for the record, Mr. Chairman.

[Questions submitted by Senator Cannon. Answers supplied by Department of the Navy:]

Question. Now, looking at your tactical air wing force structure, first of all, which carrier will be decommissioned in FY 1976?

Answer. In FY–1976 two carriers will be decommissioned: USS *Hancock* (CVA–19) and USS *Oriskany* (CVA–34).

Question. Since the carrier force will remain at 13 rather than 12 as previously planned, which carrier is the 13th?

Answer. The USS *Roosevelt* (CVA–42) will operate [deleted] until the USS *Eisenhower* (CVAN–69) is commissioned. *Roosevelt* will then drop from the force levels and the USS *Coral Sea* (CVA–43) will become the [deleted] *Coral Sea* will remain in the force until the USS *Carl Vinson* (CVN–70) is commissioned.

Question. How may tactical air wings does the Navy have now and what is the schedule for their change as the carrier force goes down from 15 to 12?

Answer. There are 14 tactical air wings now. At end FY–76 there will be 13, and 12 and by end FY–77.

Question. Will you give us a breakout of the Navy tactical air force on a squadron level basis, i.e., how many fighter squadrons, attack squadrons, etc., do you have now, and how will the squadron totals change as the carrier force changes?

Answer. Navy tactical squadron force levels are programmed as follows:

	Fiscal years					
	1975	1976	1977	1978	1979	1980
Fighter squadrons	28	26	24	24	24	24
Attack squadrons	42	39	38	38	38	38
Total	70	65	62	62	62	62

Senator CANNON. Go ahead with the F–14.

Admiral HOUSER. Just before leaving this, I would like to make a comment about the air combat maneuvering range. We went into the air combat maneuvering range in an effort to find a way to teach pilots to fire missiles properly without expending large numbers of them. Missiles are too expensive to fire in large numbers like machinegun bullets. But the air combat maneuvering range has proven to be far more than what we expected it would be, and as Lieutenant Commander Ready says, we are not only evaluating missiles and pilots, but also developing tactics. We have a couple of rather extensive Department of Defense-sponsored exercises and evaluations next year which will use this range and also the one at Nellis.

MISSILE LAUNCH RESTRICTIONS

Senator GOLDWATER. Before you leave that, what effect have you found "g" to have on the Sparrow and the Phoenix? Can you launch either of those in excess of, say, 2 g?

Admiral HOUSER. Yes. Let me get Commander Leeds who is the F–14 program coordinator.

[Deleted.]

Commander LEEDS. Are you talking about the launch aircraft?

Admiral HOUSER. On the F–14.

Commander LEEDS. We have no significant launch [deleted] restrictions on the F–14, and Phoenix can handle up to an [deleted] target, at the heart of the envelope.

Senator GOLDWATER. Are there any restrictions on the airplane, the g's on the airplane at the time of firing?

Commander LEEDS. No, sir.

Senator GOLDWATER. Neither one of those are tube-launched?

Commander LEEDS. No, sir, they are ejected.

Senator GOLDWATER. What is the highest that you have released the Phoenix?

Commander LEEDS. Aircraft launched? I would have to check that, sir.

Senator GOLDWATER. In a turn.

Commander LEEDS. I will have to check for that.

Senator GOLDWATER. Do you know what is the highest g you have pulled on a Sparrow?

Commander LEEDS. No, sir, not launch g from an aircraft.

Senator GOLDWATER. It would be interesting to know that because we have had troubles, you know. In tube launch, I thing at 2 g you just throw it away. I was wondering what the effect would be if there is any effect on a high g launch, an aerodynamic effect on the Sparrow or the Phoenix?

Admiral HOUSER. Of course, where these missiles are located, positive g will help separate them, and then we do have ejecting cartridges to throw the missile away from the airplane to make sure that they are clear. There could be some restrictions on the releasing mechanism, but there are none that I am familiar with. We will investigate this and let you know, Senator.

Commander LEEDS. Senator, I am told we have fired as high as [deleted] on the Sparrow and that high launch g's pose no guidance problems for ejected missiles.

Senator GOLDWATER. On the Sparrow?

Commander LEEDS. Yes, sir.

Senator GOLDWATER. Did it have any effect on the trajectory?

Commander LEEDS. No, sir, it was a successful kill.

Admiral HOUSER. I would like at this time, Mr. Chairman, to introduce Admiral Alvis, the project manager for the F–14.

F–14 PROGRAM REVIEW

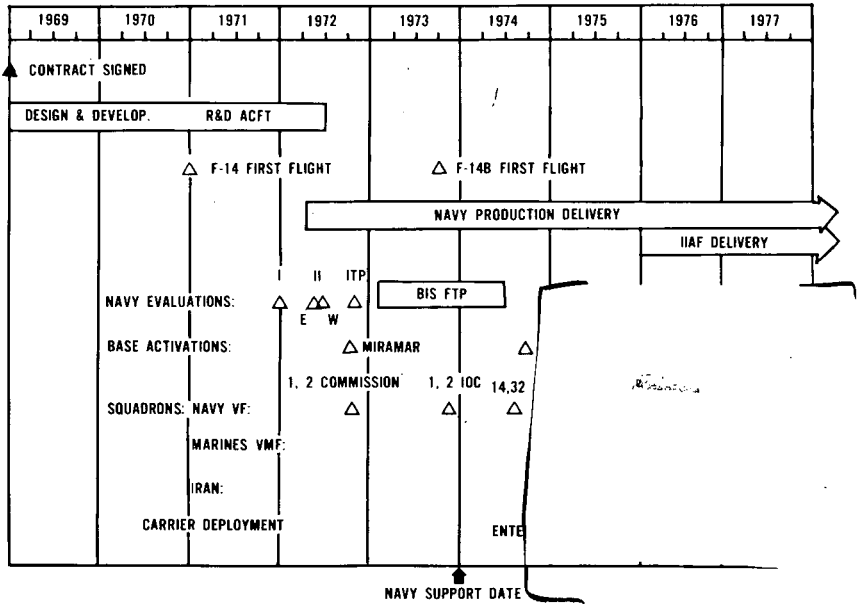
Admiral ALVIS. Mr. Chairman and members of the committee, you have heard a number of comments as to how the F–14/Phoenix weapon

system is fitting into the Navy's overall planning for air operations. I would like to discuss the airplane, its fire control system and the Phoenix missile in a bit more detail from the program management point of view. First, I will show a short movie which covers some of our current F–14 activities.

[A movie was shown.]

Admiral ALVIS. As you can see, the program is very active. I would like to give you my comments and my review of the program as I see it from Washington, and then I would like to have Commander Strole, who is just back from the 7th Fleet, give you his comments firsthand as an operator of an F–14.

F-14 MILESTONES



I will continue with a discussion of major milestones, performance, readiness, contracts, current issues, cost analysis, and the Iranian F–14 program. In calendar 1974 production built up to five aircraft per month and the year ended with production three aircraft ahead of schedule. Our second operating base at Oceana, Va., opened in September with the arrival of Fighter Squadrons 14 and 32. U.S.S. *Enterprise* also deployed in September. In 1975 production will continue at six aircraft per month. The main operating base for the Marine Corps will open at Beaufort, S.C., in December with the arrival of VMF–122. Three more Navy fighter squadrons will complete transition and begin training for deployments aboard *America* and *Constellation*. In midyear the U.S.S. *J. F. Kennedy* will deploy to the Mediterranean with VF's 14 and 32.

PILOT REQUIREMENTS TO FLY F-14

Senator GOLDWATER. Pardon me, Admiral. I hate to interrupt you, but how much time are you giving your new pilots on the F-14 before you assign them to squadrons?

Admiral ALVIS. Let me ask my expert that, Commander Leeds.

Commander LEEDS. The full syllabus including carrier qualifications we are doing is about 90 hours, 90 flight hours.

Senator GOLDWATER. What is the requirement of the pilot before he comes to the F-14 checkout? How much time does he have?

Commander LEEDS. We are training mixed experience aircrews now, sir, some who have previous deployment experience and a few that have just completed the training command, with about 250 hours.

Senator GOLDWATER. You are taking them right out of training?

Commander LEEDS. Yes, sir; the top people.

Senator GOLDWATER. You give them 90 hours.

Commander LEEDS. Yes, sir,

Admiral HOUSER. Let's clarify that a moment, Senator.

The first two squadrons we did not. Each of the pilots had previous experience. We are now taking some of the top graduates and we are keeping our eye on those, but they seem to be making the transition quite successfully.

Senator GOLDWATER. That is the history of new airplanes, is it not?

Admiral HOUSER. Yes, sir.

F-14 PERFORMANCE

(AS OF 1 JAN 1975)

- o 25000 TOTAL FLIGHT HOURS TO DATE
  - OF WHICH 16000 ARE ATTRIBUTABLE TO NAVY TRAINING AND OPERATIONS
- o 110 AIRCRAFT IN FLIGHT STATUS
  - OF WHICH 91 ARE ASSIGNED TO NAVY TRAINING AND OPERATIONS

Admiral ALVIS. As of the first of January the F-14 had accumulated 25,000 flight hours and 110 aircraft were in a flight status. During 1974 there were 26 Phoenix missile firings, 23 of them by Navy pilots.

I would like to show three of the more significant shots. This is a shot against a [deleted] simulated cruise missile. The missile was detected in "track while scan" mode and the Phoenix launched at [deleted]. A lethal hit was achieved. It should be noted that the F-14 fire control system could have been tracking 23 additional targets and could have fired 5 more Phoenix missiles almost simultaneously.

This is a live warhead shot against a simulated air-to-surface missile, ASM. The ASM launch occurred at [deleted] feet. The ASM was destroyed as it passed through [deleted].

This was a launch in the air combat maneuvering mode against a maneuvering target. The missile was fired in a slightly offset tail

chase position with the F–14 [deleted] miles behind an F–86 drone aircraft. Four seconds after missile launch the F–86 initiated a [deleted]. At the time of lethal intercept, the Phoenix was maneuvering at [deleted].

PHOENIX LAUNCH RESULTS TO DATE

	F-14	TOTAL
o LAUNCHES	58	102
o HITS	44	73
o NO TESTS	9	13
o MISSES	5	16
o SUCCESS RATE	90%	82%

To date we have launched 58 Phoenix missiles from the F–14 with a 90-percent success rate.

SIX MISSILE LAUNCH

Senator GOLDWATER. Did you not launch five at one time?

Admiral ALVIS. We have had multiple launchings, including six at one time.

Senator GOLDWATER. And had five hits?

Admiral ALVIS. We launched six, we had four hits. We had one no test because of a failure of one of the targets, and one miss.

During the past year F–14 operational readiness has been about [deleted]. This is considered reasonable for this stage of the program but we expect to improve this figure.

EXPECTED OPERATIONAL READINESS RATE

Senator GOLDWATER. How high do you expect to get that?

Admiral ALVIS. Our goal is about [deleted] percent.

Senator GOLDWATER. What is the Navy's experience on readiness? Do you ever get as high as 80?

Admiral ALVIS. I do not think we do. I have figures on about three aircraft here for comparison purposes, and they are not quite that high.

Admiral HOUSER. Generally speaking, we do not get as high as 80. We have a goal of [deleted] percent and if we get over [deleted] percent, we are pleased.

Some of the aircraft are always in maintenance, so they are not available. They are programed not to be there. So we are not trying to shoot for 100 percent, Senator.

F-14 READINESS IMPROVEMENT STATUS
EVALUATION (RISE) SUMMARY
(AS OF 21 JAN 1975)

RANK	%READINESS IMPACT	SYSTEM
1	7.10	AWG-9 RADAR SUBSYSTEM
2	6.70	SCHEDULED INSPECTION
3	4.45	TF-30 ENGINE
4	3.52	AVA-12 VERTICAL DISPLAY INDICATOR
5	3.50	FUEL QUANTITY MEASURING SYSTEM
6	3.29	FLIGHT REFERENCE ASSOCIATED EQUIPMENT
7	3.07	WEAPON RAIL INSTALLATION
8	3.05	AWG-15 FIRE CONTROL
9	2.41	ASN-105 APPROACH POWER COMPENSATOR
10	2.35	APX-76 INTERROGATOR SET

Admiral ALVIS. These are the 10 top items reducing operational readiness. In addition to normally expected improvements as maintenance personnel and procedures mature, we have a reliability improvement program under way which will pay off at about 15 to 1 in life cycle cost avoidance.

F-14 CONTRACT STATUS

- FY-74 AIRFRAME CONTRACT AWARDED ... 24 OCT 74
- FY-75 AIRFRAME CONTRACT AWARDED ... 31 DEC 74

Last year at this time our 1974 contract with Grumman Aerospace Corp. had not been awarded due to restrictions placed on advance payments by the Byrd-Proxmire amendment to the fiscal year 1974 Authorization Act. Grumman has now obtained a commercial line of credit and the contract was awarded in October. In addition, the fiscal year 1975 Grumman contract was awarded in December this past year.

F-14/PHOENIX CURRENT ISSUES

- FY75 BUDGET HAS BEEN SEVERELY SQUEEZED AS RESULT OF
  - AIRFRAME COST INCREASE
  - RISING ENGINE PRICES
  - ECCM COST INCREASES
  - UNBUDGETED OPEVAL
  - POTENTIAL IMPACT OF LOSS OF TWO VF-1 AIRCRAFT
- BUT SO FAR WE HAVE BEEN ABLE TO MAINTAIN FISCAL EQUILIBRIUM WITHOUT IMPACTING OUR SUPPORT PLANS.

I would like to add that we have had a number of price increases in fiscal 1975, but we have had some offsetting credits and are thus far managing within the funds available without reducing the support level of the aircraft.

Aircraft Cost Analysis — Date: 24 January 1975

AIRCRAFT MODEL: F-14A — POPULAR NAME: Tomcat — MANUFACTURER: Grumman — Estimate Category: D

Program Item	FY 74 Unit Cost	Qty 50 Total Cost	FY 75 Unit Cost	Qty 50 Total Cost	FY 76 Unit Cost	Qty 36 Total Cost	FY 77 Unit Cost	Qty 9 Total Cost	FY 77 Unit Cost	Qty 36 Total Cost
1. Airframe/GFE	6,500,000	325,000,000	6,965,007	348,250,350	7,453,000	268,308,000	7,676,857	69,091,713	8,313,350	299,280,600
2. Charges Allow.	264,589	13,229,450	223,000	11,150,000	337,462	12,148,632	291,556	2,624,004	249,400	8,978,400
3. Engines	1,833,900	91,695,000	1,944,600	97,230,000	2,100,600	75,621,600	2,168,200	19,515,800	2,329,800	83,872,800
4. Eng.Accessories	8,626	431,300	9,118	455,900	9,670	348,120	10,153	91,377	10,254	369,144
5. Electronics	2,116,239	105,811,950	1,943,291	97,164,550	2,170,128	78,124,608	2,213,409	19,920,600	2,396,607	86,277,852
6. Armament	22,005	1,100,250	25,752	1,287,600	27,310	983,160	28,675	258,075	28,959	1,042,524
7. Other GFE	44,807	2,240,350	47,548	2,377,400	52,801	1,900,836	55,441	498,969	55,990	2,015,640
Subtotal GFE	4,025,577	201,278,850	3,977,309	198,515,450	4,360,509	156,978,324	4,475,869	40,282,821	4,821,610	173,577,960
8. Nonrecurr. Cost	0	0	130,000	6,500,000	84,000	3,024,000	0	0	0	0
9. R&M Improvement	0	0	0	0	555,556	20,000,016	822,900	7,406,100	0	0
10. Flyaway Cost	10,790,166	539,508,300	11,288,316	564,415,800	12,790,527	460,458,972	13,247,182	119,404,638	13,384,360	481,836,960
11. Airframe PGSE		29,326,000		19,166,000		30,180,000		1,343,000		22,430,000
12. Engine PGSE		2,876,000		1,111,000		2,400,000		156,000		1,836,000
13. Avionics PGSE		40,870,700		47,284,000		51,053,000		1,171,000		32,670,000
14. Pec. Trng. Eq.		28,100,000		21,180,000		4,913,000		0		13,400,000
15. Pubs/Tech Data		11,219,000		8,309,000		8,800,000		1,069,000		5,785,000
16. Trng Fac/Parts		3,100,000		6,820,000		6,400,000		0		3,500,000
17. SPTW/Chng Verif.		0		0		11,955,000		1,156,366		8,822,000
18. Rep.of Rep.		4,600,000		3,214,200		4,100,028		0		1,100,040
19. Support Cost		120,091,700		107,084,200		119,841,028		4,895,366		89,563,040
20. Gross P-1 Cost		659,600,000		671,500,000		580,300,000		124,300,004		571,400,000
21. Adv Proc.-Cred.		-74,700,000		-55,000,000		-70,000,000		-51,000,000		-97,000,000
22. Net P-1 Cost		584,900,000		616,500,000		510,300,000		73,300,004		474,400,000
23. Adv Proc.		55,000,000		70,000,000		89,000,000		59,000,000		102,000,000
24. Program Cost		639,900,000		686,500,000		599,300,004		132,300,004		576,400,000
25. Spares		53,200,000		34,200,000		20,400,000		6,300,000		39,600,000
26. Investment Cost		693,100,000		720,700,000		619,700,004		138,600,004		616,000,000
27. Eso. (non-add)		0		0		0		0		0

This is the F–14 cost analysis sheet. The significant items are 36 aircraft at a flyaway cost of $12.79 million each. You will notice that there are two new budget lines beginning this year. The first is a reliability and maintainability improvement program which I mentioned earlier and the second is a software change verification line item. The latter item is vital in the production of a reliable tactical program which will exploit the full potential of the F–14 Phoenix weapon system.

F-14 COST ANALYSIS
($ IN MILLIONS)

- o JAN 74 PROGRAM ACQUISITION COST (334 AIRCRAFT THRU FY-77) 5982.3
- o JAN 75 PROGRAM ACQUISITION COST (390 AIRCRAFT THRU FY-80) 7313.5
- o DIFFERENCE .....+1331.2
- o DIFFERENCE ATTRIBUTABLE TO:
  - $1115.4 FLYAWAY INCREASE
    - FY76/77 REPRICING TO CURRENT REQUIREMENTS
      - PROGRAM STRETCH-OUT (3 YRS)/PRODUCTION RATE REDUCTION..... 38M
    - 56 ADDITIONAL A/C (FY78 THROUGH FY80)
      - PRODUCTION RATE 3/2 A/C PER MO. 850M
    - R&M IMPROVEMENT PROGRAM 27M
    - ECM COST INCREASE 40M
    - ECONOMIC ESCALATION INCREASE 160M
  - $83.4 SUPPORT INCREASE
    - TWO ADDITIONAL OUTFITTINGS ... SUPPORT FOR ADDITIONAL AIRCRAFT/YEARS ... ECONOMIC ESCALATION.....SOFTWARE/CHANGE VERIFICATION
  - $79.0 NET ADVANCE PROCUREMENT FOR FY81
    - ATTRITION AIRCRAFT PROCUREMENT
  - $55.2 SPARES INCREASE
    - TWO ADDITIONAL OUTFITTINGS ... SUPPORT FOR ADDITIONAL AIRCRAFT ... ECONOMIC ESCALATION
  - $4.0 RDT&E DECREASE ... INTERNAL REPROGRAMMING
  - $2.2 MILCON INCREASE ... OCEANA TRAINING BLDG, MIRAMAR FACILITIES

The F–14 cost analysis shows that the program acquisition cost has increased $1.33 billion in the past year. This increase is due to the addition of 56 more aircraft, $850 million, their associated support costs, and economic escalation due to a 3-year stretch in the program.

MISSILE: PHOENIX
MODEL: AIM-54A

NAVAL AIR SYSTEMS COMMAND
WEAPONS PROCUREMENT, NAVY
FY 1976 CONGRESSIONAL SUBMISSION

Date:
Approved By:

	FY 19 74 (Qty: 240)			FY 19 75 (Qty: 340)			FY 19 76 (Qty: 340)			FY 197T (Qty: 0)			FY 1977 (Qty:)		
	Qty	Unit Cost	Total Cost	Qty	Unit Cost	Total Cost	Qty	Unit Cost	Total Cost	Qty	Unit Cost	Total Cost	Qty	Unit Cost	Total Cost
Missile Hardware			51,156,000			56,519,000			71,129,000			20,900,000			80,507,000
G,C&A	240	172,500	41,400,000	340	157,000	53,400,000	340	170,000	57,800,000				340	193,680	65,851,200
Propulsion	240	15,000	3,600,000	340	14,400	4,896,000	340	14,500	4,930,000					15,920	5,412,800
Booster															
Safety & Arm. Mech.	240	2,500	600,000	340	2,400	816,000	340	2,435	827,900				340	2,650	901,000
Target Det. Device	240	14,000	3,360,000	340	13,300	4,522,000	340	13,475	4,581,300				340	14,760	5,018,400
Warhead	240	2,900	696,000	340	2,700	918,000	340	2,700	918,000				340	2,880	979,200
												20,900,000			
Integration & Assy.															
Engineering Changes			1,500,000			1,967,000			2,021,500						2,344,400
Procurement Support			21,970,000			14,129,000			[illegible]			3,310,000			16,283,000
Sys. Engr./Prog. Mgt.															
Contractor			11,923,000			7,696,000			8,622,000			3,310,000			5,061,700
Govt-in-house			2,500,000			2,400,000			1,252,000						1,408,200
Special Tool & Test Eq.			1,500,000			0									
Inspection Gages			100,000			100,000			[illegible]						108,000
Govt. Test Program			2,860,000			1,500,000			2,325,000						2,632,200
Data			2,271,000			2,008,000			1,994,000						2,238,900
Containers			816,000			425,000			[illegible]						834,000
TOTAL FLYAWAY COST	240	304,200	73,126,000	340	237,200	80,648,000	340	253,300	56,[illegible]				340	284,970	96,890,000
Fleet Support			19,374,000			12,552,000			[illegible]			[illegible],790,000			10,410,000
Peculiar Spt. Equip.															1,701,700
Test Equip.			10,135,000			5,465,000			2,275,000			540,000			612,000
Handling Equip.			318,000			287,000			705,000			[illegible]			1,615,000
Training Equipment			50,000			100,000			200,000			590,000			577,300
Training Services			2,105,000			1,980,000			1,500,000						2,423,000
I.L.S. Data & Pubs			3,346,000			2,850,000			2,200,000			653,000			3,481,000
I.L.S.			3,420,000			1,870,000			2,920,000			943,000			(27,000,000)
TOTAL (Less Mods & Spares)			92,500,000			93,200,000			96,700,000			27,000,000			80,200,000
Mod. of Missiles			300,000			700,000			1,720,000			–			2,000,000
Init/Rep. Spare Pts.			3,690,000			4,800,000			4,530,000			–			4,100,000
TOTAL FLYAWAY COST	240	402,000	96,490,000	340	240,200	98,700,000	340	302,900	102,950,000			27,000,000			86,300,000

The Phoenix missile cost sheet shows 340 missiles for fiscal year 1976 at a flyaway cost of $253,300 per missile.

PHOENIX COST ANALYSIS
($ IN MILLIONS)

- o PROGRAM ACQUISITION COST (JAN 75 SUBMISSION) 1174.7
- o PROGRAM ACQUISITION COST (JAN 74 SUBMISSION) 1119.1
- o DIFFERENCE 55.6
- o DIFFERENCE ATTRIBUTABLE TO;
  - 45.0M INCREASED ECONOMIC ESCALATION
  - +7.9M SUPPORT REPRICING BASED ON PRIOR ACTUAL EXPERIENCE
  - -2.7M FY72 RECOUPMENT
  - +5.4M FY72 OVER TARGET

The Phoenix cost analysis sheet shows an increase of $55.6 million in program cost most of which is due to economic escalation. The Iranian F–14 program is planned for 80 aircraft and [deleted] Phoenix missiles. The Government of Iran is currently considering a follow-on buy of additional Phoenix missiles.

F-14/PHOENIX IRANIAN PROCUREMENT

- o F-14 PROCUREMENT
  - 80 AIRCRAFT
    - AND RELATED SUPPORT
  - $1.781 BILLION
- o PHOENIX PROCUREMENT
  [redacted]
- o GOVT OF IRAN CURRENTLY CONSIDERING FOLLOW-ON PHOENIX PROCUREMENT

SUMMARY

- o $5.3 BILLION INVESTED THROUGH FY-75 (F-14 & PHOENIX)
- o TEST/OPERATIONAL EXPERIENCE SHOWS THAT THE WEAPON SYSTEM IS MEETING OPERATIONAL OBJECTIVES
- o CONTINUED CONFIDENCE THAT F-14/PHOENIX WILL ACCOMPLISH THE MISSION FOR WHICH IT WAS DESIGNED
- o 2ND CVA DEPLOYMENT IN THE [redacted]
- o BEAUFORT ACTIVATION ... [redacted]
- o INITIAL IRANIAN BASE ACTIVATION ... [redacted]

In conclusion, we believe the F–14 is meeting its operational objectives and will accomplish the mission for which it was designed.

And to keep me honest, I would like to have Commander Strole give you his first hand comments. He is just back from the *Enterprise* with the 7th Fleet.

EFFECT OF IRANIAN BUY ON NAVY PRICE

Senator GOLDWATER. I really do not know if this is the time for this question because it is getting into money, but I guess it is.

How has the Iranian sale affected the Navy's unit price?

Admiral ALVIS. We had it broken down to show exactly how much money we have saved in dollars across the whole program. They are buying in two separate increments. I cannot answer you precisely, but I can give you how much money we have saved as a result of their purchase of aircraft as a lump figure.

Senator GOLDWATER. What does that amount to?

Admiral ALVIS. I have the figure here.

Due to the increase in quantity, we feel, we saved $48 million. In the Research and Development recovery, they paid us $174.2 million,

and in administrative charges which they pay to us to administer their program for them, they paid us $36.6 million.

Senator GOLDWATER. Do you have the equivalent program unit price that Iran is paying for the F–14?

Admiral ALVIS. Their flyaway unit cost is essentially the same as ours. The 1975 missile buy for them, and their 30 aircraft were negotiated right along with ours, and their unit cost is about the same as ours.

Senator GOLDWATER. What is that, $13.3 million?

Admiral ALVIS. The one that I showed you there was the 1976 buy, the one we have not negotiated yet, and that was $12.79 million. Last year it was a little bit less.

Senator GOLDWATER. So Iran's purchase has given us an advantage of about $248 million; is that correct?

Admiral ALVIS. I think that adds up about, right, $259 million, yes, sir.

You must realize that the $36.6 million they gave us for administrative charges, is used to hire some additional people to help administer their program, so it is not a real savings.

IRANIAN PROGRAM AND SCHEDULE

Senator GOLDWATER. What is their total buy?

Admiral ALVIS. Eighty aircraft and [deleted] missiles to date, and they are looking at an additional buy of missiles at this time.

Senator GOLDWATER. And when are their first cadets coming over?

Admiral ALVIS. They have students in Pensacola right now in weapons systems operator training, and their first two pilots will arrive in July of this year.

Senator GOLDWATER. And then will they take over their own training in Iran?

Admiral ALVIS. Yes, sir, we will train two Iranian Air Force instructor pilots and four Grumman contractor instructor pilots. These six pilots, then, will go to Iran and set up their training program in January of 1976.

Senator GOLDWATER. Thank you very much, Admiral.

BRIEFING ON F–14 DEPLOYMENT ON ENTERPRISE

Commander STROLE. Good morning, Mr. Chairman, and members of the committee. I am Commander Denny Strole, the Executive Officer of Fighter Squadron 1. I have been with the squadron a little over a year now, throughout this predeployment training cycle as well as during the current WESPAC deployment. As you know, VF–1 and VF–2 were originally established in October of 1972. We finished replacement squadron training in July of 1973, and began independent operations, leading to our deployment to the Western Pacific aboard the U.S.S. *Enterprise* in September of last year.

Since we deployed, our operations at sea have been in areas widely dispersed. We departed California and proceeded to the vicinity of Hawaii where we operated for a period of about a week prior to our transit to the Pacific, to the South China Sea. We operated in the South

China Sea for several periods, also in the area of the vicinity of the Gulf of Tonkin for a period of about 30 days, prior to our excursion into the Indian Ocean, which was for a period of about 40 days, and then most recently back to the South China Sea.

On the deployment thus far, the 2 F–14 squadrons, we have flown about 1,400 sorties, which has amounted to about 2,500 hours. That was through February. And the air crew experience level now is we are averaging about 300 total F–14 hours per air crew, and approaching 100 carrier landings for the aircrews, both VF–1 and VF–2.

The operational employment of the F–14 is going extremely well so far. Routinely we have been employing all of the mission flexibility which was designed into the airplane, air combat maneuvering. We have been continually practicing with other air wing aircraft, the A–7's and A–6's, and initiated programs with other deployed carriers which had the F–4's aboard, as well as a 1-day exercise with the AV–8 Harriers off of Subic Point in the Philippines.

We have also been conducting strike escorts with attack airplanes within the air wing, air-to-air and air-to-ground gunnery, missile exercises where we employed the Phoenix, Sparrow as well as Sidewinder missiles. Air intercept control, we have done the routine voice procedures control, but also, as was mentioned earlier, the data link control with the E–2 as well as with the ship, the USS *Enterprise*, and our escorts. This is a two-way data link that has been working very well.

We have also participated in many anti-air-warfare exercises with other task groups as well as exercises within our own task group, and also fleet superiority exercises which have been designed to develop and refine tactics for the F–14, EA–6B and E–2 aircraft.

Around the ship the F–14 has proven to be an exceptional airplane, not only in the deckhandling environment, but in the catapult, the pattern and the arrested landing. I think everybody unanimously agrees that the airplane is a superb performer in the shipboard environment.

The F–14 has a tremendous offensive capability which I think we have proven through our deployment, and the fighter pilots of both squadrons agree that the airplane is a superb dogfighter in all environments.

The capability of the AWG–9 weapons system has continually astounded us throughout our deployment as it did during our training cycle, the long range detections that were advertised, and which we are in fact getting, as well as the multiple target track capability.

The TWS mode we employed in air combat maneuvering effectively. When we turn toward the bogies, we can pick up the targets, and determine the size of the adversary raid that is coming at us. As Commander Ready mentioned earlier, we can determine target altitude, air speed, heading, just about anything we want. We can then commit to the simulated Phoenix, or Sparrow missile as we get in closer and optimize our tactical formations for the in close engagements.

Time and again in the fleet exercises that we have run, the multiple target track capability, as I said, continues to astound us. It is working and is very effective.

All of these airframe avionics capabilities, coupled with the inertial navigation system I feel really has provided us with a tremendous autonomous capability in not only the ACM environment, but also anti-air-warfare and fleet-superiority environment.

Regarding maintainability, our maintenance troops are finding the airplane easier to maintain at sea than they originally thought. The people we have, many of them are on their first enlistment. The initial cadre of factory-trained people we had in both squadrons amounted to about 50, and most of them are gone now. The people that we are getting into the squadrons now are normal sailors coming through the normal training pipeline. They are finding that although the airplane is complex, it is not a maintenance nightmare, and they are able to maintain it and keep it flying.

Reliability is steadily improving. We had several avionic and airframe problems during our current turnaround cycle that could be identified, and corrective action was initiated on these areas. They proved during deployment not to be a problem to us.

While I feel that the deployment has been very successful for us thus far, we have had several areas of concern. One is a matter of water intrusion. Although we had operated the airplane in a water environment on the west coast prior to our deployment, we did not experience anything like the torrential sustained downpours that we did on our arrival in the Philippines, with several different typhoons that passed through the area right after our arrival. Intermediate measures were taken to correct this, and it has improved steadily throughout the deployment, but I feel that we still have some work to do in the water intrusion area.

Also, Admiral Houser mentioned we lost two airplanes in January, one on the 2d, one on the 14th, which did impact us quite a bit. Special teams were formed to investigate the accidents and determine the causes, and special testing or inspection procedures were initiated which we accomplished and resumed normal flight operations as the airplanes were inspected and tested. By the end of January we were back in the air flying, and no one had lost any confidence in the airplane. Today we are conducting routine operations. In fact, the ship is at sea this week on its last operating period.

In closing, the most significant indicator, to myself anyway, of the success of the employment thus far is the degree of normalcy that we have experienced. I guess we all expected at some point in time the bubble would break and things would become quite hectic. As a matter of fact, that has not been the case.

Since our first day aboard, during the deployment, it has just been routine normal operations and not the hectic pace that we had anticipated with the deployment of a new aircraft for the first time.

That concludes my remarks.

CAUSE OF F–14 OPERATIONAL CRASHES

Senator GOLDWATER. Am I right in remembering that you had two aircraft losses on your Indian Ocean cruise?

Commander STROLE. One was off of the Philippines, and the other was just as we entered the Indian Ocean, yes, sir.

Senator GOLDWATER. They were identical, were they not?

Commander STROLE. They were very similar in nature. The circumstances in each accident were slightly different, but overall they were essentially the same, yes, sir.

Senator GOLDWATER. Did you come to any conclusions as to what might have happened? I understand it was an engine problem.

Commander STROLE. Yes, sir. Of course, we were not able to recover either airplane because of the areas where they crashed, but the primary suspect was the engine. There were other areas that were a potential problem that were also inspected, but it boiled down essentially to the engine, yes, sir.

Senator GOLDWATER. You recovered the crews, did you not?

Commander STROLE. Yes, sir, in both cases.

Senator GOLDWATER. What did they tell you had happened?

Commander STROLE. In both cases they were on a normal intercept mission and the accidents occurred approximately a half hour or so after takeoff. They were both in straight and level flight and medium altitude, at around 400 knots or so. There was a thump heard and a subsequent fire, and shortly thereafter a loss of control and ejection.

SIMILAR ENGINE INCIDENTS IN 1974

Senator GOLDWATER. Did you not have similar engine accidents in 1974 but you did not lose the airplane?

Commander STROLE. Yes, sir. The airplanes were not lost in that case, however.

Senator GOLDWATER. But did you discover from those returned aircraft what happened?

Commander STROLE. There was an indication, I believe, at the time of what the problem was, and as far as I know, it was investigated, yes, sir.

Senator GOLDWATER. What?

Commander STROLE. It was investigated.

Admiral HOUSER. Senator, may I speak?

Senator GOLDWATER. Yes.

Admiral HOUSER. These engines were analyzed, and it was on the basis of what we found out from earlier engine difficulties that we were able to set up the analysis program to find out what probably happened to these two.

I would like to ask Admiral Lee to give you some details on the findings of those.

Senator GOLDWATER. I was interested. He cleared this up. I thought it might have been an unusual angle of attack that caused a lack of air for one engine.

Admiral HOUSER. We did have an engine that failed in that condition but it was on a test airplane, and we were trying to get it into unusual attitudes and actually make jam accelerations and go to full afterburner from very low power settings. And this is where we would expect to lose them. These two, however, did not have that same circumstance, as they were in a straight and level attitude, at a medium altitude.

Senator GOLDWATER. You never had any problems with high angle of attack and loss of power from engines?

Admiral HOUSER. We have had afterburner mislights. On this very high angle of attack, that I believe we showed you last year, both engines continued to function even though the airplane had negative speed. We have had afterburner blowouts at a high angle of attack.

There have been programs to correct that, and since the fixes have been installed, the afterburners have been running well.

Senator GOLDWATER. Did the admiral have something to say about this?

Admiral LEE. I would like to describe that if I could. As you understand the TF–30 engine is a rather old engine. It was developed for the F–111, and so it had many thousands of hours, and I think we provided this for the record before we put it into the F–14, but as you can understand, the F–14 carrier operation is a different environment than the engine had been subjected to before. So these two accidents—and we based our findings not only on pilots' reports for these two accidents, but from our experience with this engine in tests and some other failures we've had—we believe that these two failures came from one of two areas of the engine. Area No. 1 is the first-stage fan. Now this is a fan engine and the fan has three stages. The first-stage fan develops cracks down in the midarea of the fan which they call the shroud area. Apparently in a chloride atmosphere, namely at sea, if little cracks appear in this first-stage blade, then this blade is subjected to stress in the chloride environment; the cracks quickly propogate, and the blades can fail. And of course we didn't know this until we got these airplanes to sea, but we have a fix now in the works to take care of that problem.

The second problem has to do with the third-stage fan blade, and in that one the fan-disc combination, that is the blade-disc combination has a resonance point somewhere between 10,500 and 11,000 rpm. This is not a problem so long as the seal between the second and third stages is very tight because that damps out the resonance; especially since the engine normally runs around 10,200 rpm. But it turns out that if this seal, which you might say is a bracing element of the engine, if this seal wears between the second and the third stage, then the damping doesn't take place and if the rpm of the engine creeps up toward 10,500 you get resonance. And of course when you get resonance in an engine of this nature in this third-stage disc-blade element, it can cause it to fly apart.

Now what we've also found in investigating this situation is if we have a very tight seal manufactured to specifications, we do not have this problem, but after a while with afterburner mislights and normal wear and tear on the engine, the old seal would wear a little bit, and permit this resonance problem, which could destroy the disc and the blades and hence the engine.

We now have a new seal going into this engine and this new seal has a harder bearing surface on it. We've also put a different bearing surface on the disc itself, so that we believe this will solve the problem. In the meantime, we are inspecting these first-stage discs on a daily basis and we are inspecting the seals periodically to make sure that there is no wear. And as quickly as possible we are going to put new seals in and rework these first-stage blades. We believe that this will fix the problem.

Now most of our engines—oddly enough, you think you have a mature engine until you put it in a different environment. This is not only true for the TF–30 that you've been associated with all these years, but almost every engine. So we do not think this is all that unusual for an engine to develop these problems in a new environment, and that is what is happening to the TF–30. We are working very hard to get fixed on a permanent basis.

Senator GOLDWATER. May I ask you, do these accidents involve the changing of power settings?

Admiral HOUSER. Both these accidents, I believe, were steady state.

Commander STROLE. There was no change in the power setting. Both airplanes had just steadied out of a turn and had been on a steady course for 30 seconds to 1 minute with the power stabilized.

Senator GOLDWATER. You will keep us posted?

Admiral HOUSER. Yes, sir.

Admiral LEE. We will certainly keep you and your staff fully informed as to our progress.

Senator GOLDWATER. That is all.

CONTRACTING PLAN FOR FISCAL YEAR 1976 AND 197T

Mr. CROMWELL. Admiral Alvis, how do you plan to contract for the fiscal year 1976 and 197T airplanes? Is that going to be a combined contract or separate contracts?

Admiral ALVIS. I have the contracting officer with me. I would prefer to get his comments on this first hand. We will contract basically for the fiscal year 1976 airframe procurement as a unit. Fiscal 7T will be combined with the fiscal year 1977 procurement.

Mr. CROMWELL. Will you explain how the Iranian airplanes are going to be bought? In other words, which go with which?

Admiral ALVIS. With the 1975 contract that we have negotiated and awarded, there were 30 of the Iranian airplanes included. That was the first buy of airplanes. The second buy is 50 airplanes. It will be included in our 36 airplane purchase for 1976.

Mr. CROMWELL. How did their delivery time periods compare?

Admiral ALVIS. Their delivery time period stretches out longer than ours. Their last airplane is delivered, in July 1978.

Mr. CROMWELL. And when are the Navy 7T airplanes being delivered?

Admiral ALVIS. They will be in January, February and March of 1978.

Mr. CROMWELL. They are going to be combined with your fiscal 1977 buy in the contract, and yet they will have an overlapping delivery period with the Iranian program and with the 1976 program?

Admiral ALVIS. Yes.

7T AIRPLANES FULL FUNDING DEFERRAL

Mr. CROMWELL. Now couldn't the Navy 7T airplanes be advance buy funded in 1976 and then fully funded in 1977 if they are going to be contracted for with the 1977 buy?

Admiral ALVIS. We have looked at that as a result of earlier questions on the subject and it could be done, but it would require that

almost all of the 7T money be moved forward to 1976 and only $20 million of the money could be moved back into 1977.

Mr. CROMWELL. It would be a reduction of $20 million in the 7T budget request on that basis.

Admiral ALVIS. Yes; but we would have to increase the 1976 budget. In other words, if we took all of the money out of 7T we would have to move $118 million to fiscal year 1976 and $20 million to fiscal year 1977.

Mr. CROMWELL. Thank you.

TOTAL F–14 PROGRAM PLAN

Admiral Houser, what is the total Navy program for the F–14? 390?

Admiral HOUSER. 390.

Mr. CROMWELL. How many squadrons will that support?

Admiral HOUSER. Eighteen squadrons is what we have been told to form with that number.

Mr. CROMWELL. That's 4 Marine and 14 Navy.

Admiral HOUSER. Yes; it is slightly different. Last year we had 12 Navy and 4 Marine for a total of 16. This year in the decision that was rendered for 390 airplanes they were listed as 18 squadrons for the Department of Navy but the distribution will be 4 to the Marine Corps and the idea of making them all Department of the Navy assets, I believe, is to indicate that they would be available whenever needed by the Navy.

Mr. CROMWELL. How would you deploy them all on carriers? Two F–14 squadrons per carrier?

Admiral HOUSER. Probably, certainly the initial deployments will be two F–14 squadrons per carrier.

F–14 CARRIER CONVERSIONS

Mr. CROMWELL. Is the Navy budgeting for [deleted] carriers and outfitting with F–14 support equipment? Is that right?

Admiral HOUSER. In the later years of the 5-year defense plan we have our [deleted] carriers programed for conversion to the F–14 support.

Mr. CROMWELL. Why is this being done if there are only [deleted] carriers worth of F–14 squadrons in the Navy?

Admiral HOUSER. This program has changed continually over the last several years and the budgeting that we have for support equipment will provide for additional carriers to support the airplanes. At the present time it does not appear feasible to outfit every carrier for this limited number of squadrons. A trade-off has to be made for what you paid for support for each of these carriers and how many airplanes you will operate. We think these programs will be in balance.

Mr. CROMWELL. They are not balanced if you only buy enough F–14s for [deleted] carriers and you are asking for the money to put support equipment on [deleted] so they are not in balance, at least the way you have explained it right now.

Admiral HOUSER. I do not believe we are asking for the money right now. We are asking for it in later years. These are for planning purposes.

Mr. CROMWELL. I am sorry. I thought that the support for the [deleted] carriers was in fiscal 1976.

Admiral ALVIS. I can give you that, just a second.

Admiral HOUSER. We will check the record.

Mr. CROMWELL. All right.

Admiral ALVIS. The [deleted] carriers will be in fiscal 1977 and 1978. That is the plan.

Mr. CROMWELL. No more questions.

Senator GOLDWATER. I have a few. Are we going to have the Marines this afternoon?

Mr. CROMWELL. Right.

PHOENIX MISSILE INVENTORY

Senator GOLDWATER. Continuing on the F–14, what is the Phoenix inventory at this time?

Admiral ALVIS. At this time with a quick calculation we have purchased about—although not all delivered—about a thousand.

[Pause.]

Admiral ALVIS. 592 have been delivered; we are now awaiting delivery of 240 additional; in the 1975 contract, we are already purchasing 340 additional, and of course, for the 1976 budget we are discussing here it will be 340 additional.

Senator GOLDWATER. So your planned inventory is the total of those?

Admiral ALVIS. Our planned inventory is [deleted].

Senator GOLDWATER. OK.

NO MAJOR MODIFICATIONS INDICATED ON PHOENIX

Do you have any modification programs underway for the Phoenix?

Admiral ALVIS. We do not have any large modification programs underway. We are making minor missile modifications as we go along and as we find the problems in our captive carry programs, but we do not have any major modification programs underway, at this time.

Senator GOLDWATER. Do you want to add to that, Admiral?

Admiral HOUSER. Yes, sir.

We have been studying a major modification program and this would depend somewhat on the total buy of the Iranians. If they increase their missile purchase substantially, it may be useful for us to go to an advanced model of the Phoenix. But at the present time, we will stay with what we have.

Senator GOLDWATER. Could you tell the nature of that major modification?

Admiral HOUSER. It is a simple modification, it is called a dry Phoenix. Some of the parts of the missile will be simplified, some of the components will be reduced and by making the missile in this fashion it would become cheaper and almost offset the development cost. This would be our goal, to get a simpler missile if we could, but overall to pay no more for it.

Senator GOLDWATER. Thank you.

COST INCREASE ON F–14

On the F–14, I understand that the fiscal year 1975 contract for 50 aircraft at $348.3 million is about $23 million over the amount appropriated in 1975. Two questions.

What are the reasons for this, and how will the additional funds be secured?

Admiral HOUSER. I would like to have the project manager answer this, Admiral Alvis?

Admiral ALVIS. The increased cost for the 1975 contract was due to two things, one was the labor hours to manufacture the airplane are higher than we had projected when we produced the budget. Two years ago we projected a more optimistic learning curve than Grumman actually achieved. The second item was increased economic escalation. I can break these down for you by dollar amounts, but those are the two primary reasons that the airframe contract was negotiated $23 million over what we had budgeted for that item in our program.

Senator GOLDWATER. Will you break that down for the record?

Admiral ALVIS. Yes, sir.

[The information follows:]

The breakdown of the 23 million increase for the FY75 airframe is as follows: 11.2 million is the cost impact of a .8 million increase in Grumman manhours, 3.5 is an unbudgeted Grumman wage adjustment, 2.3 is attributable to a cost of living wage increase, 7.0 is the cost impact of 1.8% higher profit than projected and a savings of .7 represents negotiated reductions in General & Administrative charges and support charges. The net increase is 23.3 million.

Senator GOLDWATER. And how would additional funds be secured?

Admiral ALVIS. Within the program we hope to effect some economies. For example we are looking at potential savings in the fiscal year 1974 AWG–9 and associated support contract. With these savings we may be able to cover the shortfall. Furthermore we could save a few dollars by not incorporating the ECM ALQ–126 in fiscal year 1975 production. This then hopefully allows us the additional funds to cover the shortfall.

Again, we have this broken down in detail which we will be glad to provide for the record.

[The information follows:]

It was our intention to offset the FY75 airframe cost increase with a potential $21 million credit from the FY74 AWG–9 contract and by deferral of production incorporation of the [deleted] until FY76. It is noted that from a technical standpoint, our most optimistic concurrent program will not permit production incorporation of the [deleted] until the FY76 procurement. However, we have now concluded that the FY74 AWG–9 contract credit will not offset the FY75 airframe cost increase. The Navy is therefore currently examining other alternative sources of offset funding with a view toward minimizing or eliminating impact on our support planning.

Senator GOLDWATER. All right.

F–14 CONTRACT PROVISIONS

Please explain the escalation factor in this contract. Is it possible under this arrangement the contractor could make excess profits if he produced the aircraft for less man-hours than anticipated but received an escalation factor based on the contracted for man-hours?

Admiral HOUSER. I would like to ask Admiral Lee.

Admiral LEE. Senator Goldwater, this fiscal year 1975 contract was negotiated last year from June until October. In March of last year, the Department of Defense put out a circular encouraging all of us in the contracting business to put economic adjustment clauses in all of our contracts because you cannot expect a contractor to bid on a fixed price contract 2 years in advance without some kind of adjustment if the economy goes awry. And of course, you understand that almost every contract is different. We negotiate each one of these contracts and they are all different, but on this particular contract with Grumman which was signed in December, it was a fixed price contract and it has an abnormal escalation provision in it such that if escalation is more than 6 percent they get some extra money. This applies only to labor and the overhead costs, exclusive of fixed expenses and we'll take into account the Consumer Price Index plus the labor rates for aerospace workers for New York and New Jersey so that if escalation is more than 6 percent during the time of this contract, as evaluated in January 1976, July 1976, and July 1977, then Grumman will get some extra money to pay for this additional effort. If escalation is less than 6 percent, the Government will get back some money, down to a 3-percent level. So the contract works both ways.

To get around to answering your specific question, we estimated—that is, in this contract—in our estimates of the profits we will make and the application of this escalation provision, the contract calls for a learning curve of 76.5 percent. And I will quickly describe what a learning curve is.

A learning curve means the following: If you build article No. 100 for a thousand, it takes you a thousand man-hours to build article 100, then a 76½-percent learning curve means that for article 200 it will take you 765 hours.

So we have Grumman on that kind of a learning curve on this contract.

There are lots of reasons for putting then on a tough learning curve. It will encourage them to have a more efficient operation. Also the less money we pay for the fiscal year 1975 buy, of course, that will be projected into the 1976 buy.

At the present time, they are tracking on a learning curve of about 78 percent. We hope they can get down to the 76.5, but you see, in order to get a windfall profit as you have described it under this economic escalation provision, they would have to get below a 76.5-percent learning curve. They did not quite meet their goal of last year, and this year they are tracking up at around 78 percent and we have reason to believe that it is going to be very difficult for them to get down. This would mean, of course, in the final analysis the profit on the contract will be reduced somewhat because they don't meet that learning curve.

But that sort of describes the contract, and we think it is a very fair one—fair to Grumman, and fair to the Government. And I think those of us in the contracting business having watched a number of companies bid on contracts, fixed price, not expecting the escalation that we had last year and many of them very nearly went under as you very well know. And for that reason, the Department of Defense has en-

couraged us in the contracting business to put reasonable fair, economic adjustment or abnormal escalation provisions into our contracts.

That really is the explanation for this.

Senator GOLDWATER. This next question will tie into that.

Is it also correct that if he exceeds the contracted for man-hours he could still end up the year in a loss position even though he receives an inflation adjustment?

Admiral LEE. If he exceeds man-hours by a wide amount he could be in a loss position; yes, sir.

Senator GOLDWATER. But it would have to be considerable?

Admiral LEE. It would have to be considerable.

Senator GOLDWATER. One last question on the F–14.

How much will we spend on F–14 simulators and training equipment?

Admiral HOUSER. One moment, Senator.

We have got the total of expenditures, but for the F–14——

Admiral ALVIS. Did you mean the total figure, or just this year?

Senator GOLDWATER. How much this year?

Admiral ALVIS. $5.6 million this year, 1976.

Senator GOLDWATER. All right. Thank you.

Admiral ALVIS. $6.1 million for peculiar training equipment in fiscal year 1976.

Senator GOLDWATER. All right.

AIRCRAFT FOR SOVIET CARRIER

Admiral Houser, referring to your statement that by the early eighties [deleted].

Admiral HOUSER. Yes, sir.

Senator GOLDWATER. How many of these aircraft, from what you know, could the *Kiev* accommodate?

Admiral HOUSER. I don't know the exact number of advanced airplanes the *Kiev* accommodate.

We believe the *Kiev* will probably operate up to [deleted].

Senator GOLDWATER. What would you say is the primary mission of this aircraft?

[Colloquy deleted.]

Senator GOLDWATER. What is your estimate of the earliest date the United States could have an aircraft of similar capability, operational?

Admiral HOUSER. At the rate we are going, [deleted].

Senator GOLDWATER. [Deleted.]

Admiral HOUSER. Yes, sir. If we wanted to get going faster and put more money into it we could.

Senator GOLDWATER. Do you think the Navy requires a similar aircraft?

Admiral HOUSER. [Deleted.]

Senator GOLDWATER. The *Kiev* is going to be a 40,000-ton ship? That's pretty big.

Admiral HOUSER. It is a large ship [deleted].

We do not look in the same manner at their fleet.

USE OF SOVIET CARRIER

Senator GOLDWATER. So that in your opinion the Soviet Navy will deploy the *Kiev* class as a [deleted] carrier?

Admiral HOUSER. Yes, sir, I think you would call it an [deleted] but it does have the capabilities of operating airplanes, and most of our ships have started out in different manners and really ended up doing other things, and I think that you will find the same thing with *Kiev*.

Senator GOLDWATER. When do they expect to launch that?

Admiral HOUSER. It has been launched. It is being fitted out now, and it should be operational [deleted].

Senator GOLDWATER. All right.

U.S. CARRIER PLANS

Getting back to ourselves, what caused the *Coral Sea* to be extended beyond fiscal year 1977?

Admiral HOUSER. One was the situation at the time. The new aircraft carriers are not coming in as fast as we had hoped that they would. *Nimitz* will be commissioned this spring.

Another consideration, I believe, is that of the Secretary of Defense desires to have a 13th carrier and the [deleted] after fiscal year 1977.

Senator GOLDWATER. Is that going to be a 4- or a 5-year extension?

Admiral HOUSER. It would be on the order of a 4-year extension until the next carrier comes in, which will be *Vinson*, in about 1981.

Senator GOLDWATER. What is the age of the *Coral Sea* now, do you know?

Admiral HOUSER. The *Coral Sea* is 28 years old, commissioned in 1947. The *Midway* is 30 years old, commissioned in 1945.

Senator GOLDWATER. I didn't think you kept them past 25. I guess you have to.

Admiral HOUSER. We didn't formerly, Senator. We didn't keep our fighter aircraft after 4 years either.

NAVY AIR COMBAT FIGHTER

Senator GOLDWATER. These questions I have apply to some testimony that we have had, but I am told that the air combat fighter is next, so if you could have that, we will get on with it.

Admiral HOUSER. It is a fairly lengthy presentation, about 25 minutes, and we can get started with it now, or put it in the record, or do what you would like, sir.

Senator GOLDWATER. Why can't you put the lengthy one in the record and boil it down—what you are doing? We have run a little longer than we had expected.

Admiral HOUSER. This is Captain Halleland, who is the project manager for the air combat fighter.

Senator GOLDWATER. Captain, if you have worked a long, hard time on this, and really want to go through it, we have got nothing to do. I know how it is to be asked to prepare those lengthy statements and then not have the pleasure of giving them. It is like giving a speech, there are three of them: one you write, and one you give, and the best one is the one you give when you are home in bed that night.

Captain HALLELAND. I think I can boil it down if I am correct in assuming that your interest is in our operational requirements; the ones we specified that the contractors address, and then where we stand as far as——

Senator GOLDWATER. You just go as you want to.

Captain HALLELAND. All right, sir.

NAVY AIR COMBAT FIGHTER PROGRAM

This is a presentation outline I have prepared, and I will skip through this, and if you will bear with the slowness on the slides, as we go through it; I had the program background, which is primarily the congressional guidance, which I think you all are familiar with, so I will pass by that and go to the operational developments approach. We will show you what we did in the Navy in the development of our operational requirements, and the extent to which we did this.

ITERATIVE DEVELOPMENT OF NAVY 'OR'

MAY-JUNE 1974	TENTATIVE OPERATIONAL REQUIREMENTS DEFINED BY CNO'S NAVY TACTICAL AIRCRAFT STUDY
6 JUN 1974	PRESOLICITATION NOTICE ISSUED BY NAVAIR ▸ TENTATIVE OPERATIONAL REQUIREMENTS ▸ FLYAWAY COST TARGET ▸ MAJOR COST VS PERFORMANCE TRADEOFFS
15 JUL 1974	RESPONSES RECEIVED FROM 7 CONTRACTORS ▸ CONCEPTUAL DESIGNS - CONFIGURATION & PERFORMANCE ▸ DEVELOPMENT & PRODUCTION PLANS ▸ BUDGETARY COST ESTIMATES ▸ COST VS PERFORMANCE ANALYSIS

This is how we went through the development of the Navy operational requirements during May and June. We had started back in 1973, but in May and June of 1974, after direction from Congress, and under guidance of the Secretary of Defense, we prepared the tentative operational requirements, and went out to industry. We asked them to address certain things in the presolicitation notice which was issued from Navair on June 6. We gave the operational requirements. We identified a flyaway-cost target of $4½ to $6 million for them to design around. We asked that they look at specific major cost and performance tradeoffs.

I will cover these cost and performance tradeoffs in a little more detail so you will see the extent to which we went.

We received these responses, then, from the seven contractors, conceptual designs, configuration and performance, production and development plans, along with budgetary cost estimates and cost versus performance analysis.

PSN TRADE-OFF ITEMS

1. TWIN VS SINGLE ENGINE
2. DUAL VS SINGLE COCKPIT
3. MINIMUM VS DESIRED STORE CARRIAGE
4. CTOL TO V/STOL DERIVATIVE
5. ALL-WX VS NON-ALL WX FIGHTER
6. STRENGTH FOR C13 VS C7 CATAPULTS
7. $4.5M VS $6.0M UNIT FLY AWAY COST

With our studies and what we determined from analysis of the responses from the contractors, it appeared feasible for us to gain or achieve what we wanted in an operational design and what we now call the NACF. These are the tradeoff items which we specifically addressed to the contractors and which we wanted to review in their responses to the presolicitation notice: Twin versus single engine; dual versus single cockpit; skipping on down, the all-weather versus the non-all-weather fighter; and then we of course identified our $4.5 to $6 million unit flyaway cost.

I will cover just a few of these key ones which are of interest to the majority of the people.

TRADE STUDIES

SINGLE TO TWO PLACE

▲ FIGHTER ESCORT TOGW	+850 LBS TO +2000 LBS
▲ FIGHTER ESCORT RADIUS	-25 TO 0 NM
▲ ACCELERATION	+20 TO +2 SEC
▲ P_S	-50 TO -25 FPS
▲ R&D $	+4M TO +27M
▲ FLYAWAY $	+150K TO +470K

12-74-791

Looking at the trade studies, the single or two-place, is a tradeoff which I think is of prime interest. Do we want a single or two-place aircraft? The fighter escort takeoff gross weight impact, according to the seven contractors' responses, ranges from 850 to 2,000 pounds. Our radius decreased when we went to a two-place airplane, and the acceleration we desired was degraded but not by significant amounts.

Looking at the specific excess power, P_s, the R. & D. dollars, and the flyaway costs, the impacts were not of a magnitude that they could be a driving design factor.

Looking at the trade studies again, in an all-weather to a non-all-weather aircraft, these items were of particular interest. We asked to have the Sparrows deleted, and then we asked them to do varying degrees of avionics change in their assessment of this trade item. Their responses showed that the fighter escort takeoff gross weight varied between 1,200 and 2,300 pounds.

You must remember that in that figure there are approximately 1,000 pounds allowed for Sparrows missiles. The escort radius was impacted by only 50 miles, 0 to 50 miles. Acceleration impact was minimal, and our specific excess power, our R. & D. dollars and our flyaway dollars all incurred a relatively nominal impact and there were also determined not to be a significant or driving design parameter.

TRADE STUDIES

ALL WEATHER TO NON ALL WEATHER

- SPARROWS DELETED
- VARYING DEGREES OF AVIONICS CHANGE

▲ FIGHTER ESCORT TOGW	−1200 LBS TO −2300 LBS
▲ FIGHTER ESCORT RADIUS	+50 TO 0 NM
▲ ACCELERATION	−2 TO −20 SEC
▲ P_S	+40 TO +90 FPS
▲ R&D $	−14M TO −42M
▲ FLYAWAY $	−60K TO −220K

12-74-792

We looked at single- and twin-engine designs, and when we were looking at our 30,000-pound class, or less, fighter, the single- or twin-engine choices boiled down to the F–401 engine or two J–101 engines. These were the nominal ones most of the contractors responded with.

The impact deltas are as shown. The delta of the flyaway costs is missing because we were not able to calculate that from the type of responses we received. Once again, we see only nominal R. & D., acceleration and performance impacts in the tradeoff between the twin-engine and single-engine design.

TRADE STUDIES

SINGLE TO TWIN ENGINES

▶ ONE F-401 OR TWO J101 ENGINES

•FIGHTER ESCORT TOGW	+3000 LBS TO +3385 LBS
•FIGHTER ESCORT FUEL	+1225 LBS TO +1503 LBS
•ACCELERATION	-3 SEC TO +4 SEC
•P_S	-73 FPS TO -12 FPS
•R&D $	+212 M TO +18 M

For our reliability and maintainability, we asked for these particular ranges as requirements. In the PSN results, they came back with a medium range as shown. We were looking for initial production ranges as indicated, and at IOC or after fleet introduction of the mature system, we would expect to achieve numbers in the neighborhood of those shown under the IOC column.

Now, the maintenance man-hour-per-flight-hour figure. You will remember earlier from the F–5E that this number was 8½ and is what they are experiencing at the fighter weapons school right now. We must remember the F–5E is not a deployable airplane, and it initially had higher numbers than what is being experienced now. The F–5E has grown to that low value and we would expect our aircraft to improve also.

The next slide shows the engines that were considered. We identified these as candidate engines to all of contractors, and I have also shown the pertinent aircraft with which they are associated. The contractors were free to respond with all of these, plus any current service engines they thought would provide the performance in the 30,000-pound-class airplane we have identified.

RELIABILITY/MAINTAINABILITY

	PSN RESULTS		REQUIRED	
	RANGE	MEDIAN	INITIAL PROD	IOC
MTBF	1.5-4.8	2.0	2.0-3.0	2.5-3.5
MMH/FH (3M)	10.0-20.0	14.0	10.0-14.0	8.0-11.0
MTTR 'O'	1.6-4.3	2.0	.6-1.0	.5-.7
MTTR 'I'	1.5-3.3	2.0	1.1-2.0	1.0-2.0
DEPOT INTERVAL (MONTHS)	24-48	36	60	60

12-74-781

The next slide shows what we looked at in studying the VF to VA in the one basic airframe concept. We are looking for a multimission airplane in the Navy air combat fighter. We can get accurate air-to-ground delivery very similar or comparable with that now in the A–7. This accuracy is inherent in a fighter avionics suit that has a Sparrow capability. We show the increased reliance on smart air-to-ground weapons. We envision smaller payloads required for many missions, and have capitalized on this in looking at our combat employment.

We determined from our analysis of the recent [deleted] and our last years in Vietnam, prior to our withdrawal from that conflict, that future and attack aircraft survivability requires near fighter performance. If we go too slow, then we are too vulnerable to the surface-to-air weapons.

TENTATIVE VFAX REQUIREMENTS

CANDIDATE ENGINES

PRIMARY	SECONDARY
F-401 (F-14B) F-100 (F-15, YF-16) J-101 (YF-17) F-101 (B-1)	CURRENT SERVICE ENGINES

START WITHOUT GSE - - - DESIRED

12-74-794

Good fighter performance with attack provisions, such as space, power, cooling and local strength appear to be achievable in new designs. To obtain the free-fall accuracy of an A–7, since this aircraft is projected to replace A–7's in the outyears, requires a HUD, inertial platform and digital computers. These are inherent in our system.

VF TO VA

ONE BASIC AIRFRAME

- ACCURATE AIR-TO-GROUND DELIVERY INHERENT IN VF AVIONICS SUITE
- INCREASED RELIANCE ON SMART AIR-TO-GROUND WEAPONS
  - ▸ SMALLER PAYLOADS REQUIRED FOR MANY MISSIONS
- VA SURVIVABILITY REQUIRES NEAR VF PERFORMANCE
- DESIGN FOR GOOD FIGHTER PERFORMANCE WITH VA PROVISIONS
  - ▸ SPACE
  - ▸ POWER
  - ▸ COOLING
  - ▸ LOCAL STRENGTH

12-74-778

The next slide shows a comparison of what we can obtain in the way of payload and radius relative to the A–7. The major difference is in the range. The NACF range requirement is based on a very care-

ful analysis of the Navy's commitment for conventional targets worldwide. We also looked at the maximum payloads, and comparable payloads off the catapult. We did not attempt to design this airplane around A–7E maximum bomb load capability, rather we shaded toward the smart weapons concept in our requirements.

AIR-TO-GROUND FREE-FALL DELIVERY ACCURACY

- A-7E ACCURACY REQUIRES
  - HUD
  - INERTIAL PLATFORM
  - DIGITAL COMPUTER
  - PULSE RADAR

- THESE ARE INHERENT IN NACF WEAPON CONTROL SYSTEM

12-74-798

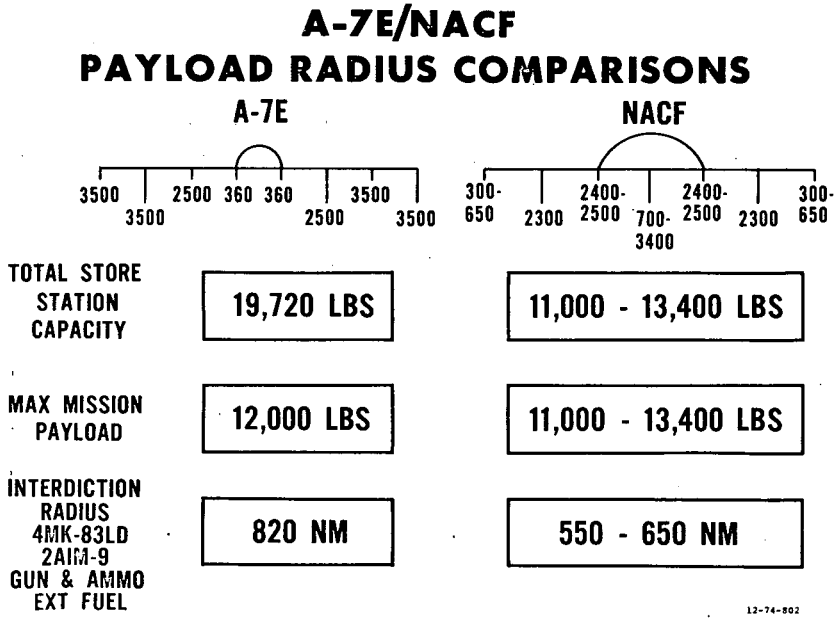
The operational concept for VFAX, which is synonymous with NACF today, shows a multimission close-in fighter, capable of day and night attack. A number of NACF's will be used in air superiority missions, requiring a beyond-visual-range air-to-air capability, and we specified a requirement for some two-seat operational trainers.

I will very quickly run through the VFAX operational requirements we provided to industry. We are looking at a fighter escort radius [deleted]. The accelerations are what we project for the Navy airplane. This performance will address the threat as we know it today or project it to be in the future.

With regard to combat ceilings, we did not attempt to go [deleted]. We are looking at carrier power approach speeds of [deleted]. That approach speed is a very demanding and driving design parameter.

The deck spot factor equates to that for an A–7, and freefall accuracy is better than A–7 as we know it today.

For takeoff gross weight, we would like to see less than 30,000 pounds. This shows the avionics requirement for both the air superiority mission, and the attack mission.



This shows our proposed schedule for introduction into the fleet. [Deleted.] This is compatible with retiring their F–4's. Theirs are older.

The total buy is shown at the bottom of the viewgraph [deleted] production aircraft and was structured from the total F–4 and A–7 replacement requirements. That number for replacement aircraft was what we gave to the contractor for planning purposes in our written request for quotation along with the number of sites which would require support.

The production schedule is typical and runs in this sort of fashion, with about 27 months to first flight. We projected, for planning purposes, a requirement for 16 development aircraft. This is negotiable and as we assess our proposals during source selection we will determine the exact number. IOC is out in the calendar year [deleted] time frame.

Production and delivery quantities are as shown here, with the particular years identified.

VFAX OPERATIONAL REQUIREMENTS

OPERATIONAL CONCEPT

- MULTI-MISSION CLOSE-IN FIGHTER
- DAY & NIGHT ATTACK IN HIGH THREAT ENVIRONMENT (VISUAL CONDITIONS)
- NUMBER OF VFAX'S WILL BE USED IN AIR SUPERIORITY MISSIONS
  - BEYOND VISUAL RANGE AIR-TO-AIR
- TWO-SEAT OPERATIONAL TRAINER

NACF SCHEDULE

FIRST FLIGHT FIRST PRODUCTION DELIVERY	
MCAS	YUMA EL TORO BEAUFORT
NAS	MIRAMAR OCEANA
NAS	CECIL LEMOORE
FIRST CV	

▸ 16 R&D AIRCRAFT ▸ 938 PRODUCTION AIRCRAFT

USMC - VMFA (RAG + 8 SQDNS)
USN - VFA (RAG + 10 SQDNS)
- VAF (2 RAGS + 26 SQDNS)

This is where we are in our NACF status program today. We received our responses from industry, the initial responses, on December 2. We commenced evaluation, and received a complete response, along with costing data, on the 13th of January. We held technical discussions with contractors where we identified deficiencies on the 15th and 16th of January, and they submitted amended contractor proposals on the 3d of February. The source selection process is now continuing, and we anticipate a source selection recommendation in May of this year. The award of a full-scale development contract is scheduled for August of this year.

FY 75 NACF STATUS

- ▸ INITIAL RFQ RESPONSES RECEIVED (2 DEC 74)
- ▸ COMPLETE RFQ RESPONSE RECEIVED (13 JAN 75)
- ▸ TECHNICAL DISCUSSIONS WITH CONTRACTORS (23 JAN 75)
- ▸ AMENDED CONTRACTOR PROPOSALS RECEIVED (3 FEB 75)
- ▸ SOURCE SELECTION PROCESS CONTINUING
- ▸ SOURCE SELECTION RECOMMENDATION EXPECTED [redacted]
- ▸ FSD CONTRACT AWARD EXPECTED IN [redacted]

The budget profile is as shown here with fiscal year 1975 money. The requirement for funding in fiscal year 1976 is what we are addressing today.

I will cover the expenditures as I have obligated them in fiscal year 1975 and how we would propose expenditures for the fiscal year 1976 funds.

BUDGET PROFILE

FY 75	20.0M
FY 76	110. 0M
FY 7T	23.0M
FY 77	131.0M

In fiscal year 1975 we allocated $8.9 million of the $20 million available to the contractors for their proposals. We have a request before the committee now for the release of the remaining funds and this money would be used for a sustaining engineering effort on the part of the selected contractor until we award the full-scale development contract.

Our in-house source selection effort will expend the amount of money shown. We had planned expenditures in the July to December 1974 period, but the money was released late. All expenditures will occur in the January to June 1975 timeframe $20 million was provided in fiscal year 1975 funding. The next slide shows a typical first-year development and shows how we would allocate the funding. We requested $110 million for fiscal year 1976. We would give 94 percent to industry, the contractor selected, and the Government in-house effort would be funded at about 6 percent, broken down into the particular elements shown.

NACF OBLIGATIONS FY 75

	JUL-DEC'74	JAN-JUN'75	TOTAL
• INDUSTRY (ACF CONTRACTORS)			16.5 M
▸ ALTERNATIVE DESIGN PROPOSALS	8.9 M		
▸ "BEST & FINAL" DESIGNS/PROPOSALS		7.6 M	
• GOVERNMENT (NAVY IN-HOUSE)			3.5 M
▸ ACF/NACF EVALUATIONS	0.0		
▸ NACF SOURCE SELECTION		3.5 M	
	8.9 M	11.1 M	20.0 M

TYPICAL NACF FSD EXPENDITURES
[OPTIMAL]

FIRST YEAR

▶ INDUSTRY (CFE/GFE CONTRACTS)		94%
• AIRFRAME/CFE (NR/REC)	26%	
• ENGINES/GFE (NR/REC)	26%	
• AVIONICS/GFE (NR/REC)	20%	
• PECULIAR GSE (NR/REC)	9%	
• ARMAMENT/DT&E	6%	
• SYS. ENG. /MGMT/DATA	7%	
▶ GOVERNMENT (NAVY IN-HOUSE)		6%
• LABORATORIES (NADC, NWC, NWL)	3%	
• TEST CENTERS (NATC, NAPTC, NMC)	2%	
• MGMT & SUPPORT (NAVAIR, NWESA, CNET, OPTEVFOR, NATSF, NARF)	1%	
		100%

I think that covers the program as we have it, Senator, at this time.
Senator GOLDWATER. That was very well done.

PRIMARY ROLE FOR NACF

Admiral, referring to the air combat fighter, there has been no shortage of outside guidance on the program. However, I am somewhat confused as to what the Navy's requirement for a new aircraft is? Is the most urgent priority an aircraft optimized for the air-to-air role or for the attack role? Is the requirement more urgent to procure a replacement aircraft for the F–4 or the A–7? Or could one aircraft be the replacement for both?

Please comment.

Admiral HOUSER. Yes, sir. The most urgent requirement is for a fighter. The F–4's are older than the A–7's. In my statement I mentioned a fighter shortage. This has been caused by the curtailing of the number of F–14's below that which we had planned. Our efforts to develop a single airframe engine combination to serve as both attack and fighter is based on the efficiencies that we get by having fewer airplanes to support, particularly aboard ship. But there is no doubt about it that his airplane would replace F–4's initially, and then A–7's.

Senator GOLDWATER. Your immediate need is a fighter.

Admiral HOUSER. Indeed it is, sir.

CONGRESSIONAL REQUIREMENTS FOR SOURCE SELECTION

Senator GOLDWATER. Referring to the Appropriations Committee Report of September 18, 1974, which, in part, states:

Future funding is to be contingent upon capability of the Navy to produce a derivative of the selected Air Force air combat fighter design.

Does Navy believe that language means the committee would expect the Navy to select only the F–16?

Admiral HOUSER. No, sir. The Secretary of Defense and his subordinates have sent a number of letters to Congress, including the Appropriations Committees, explaining what was going on, and both contractors for the lightweight fighter competition were solicited by the Navy through the Air Force for naval designs. These have come in and they are now undergoing evaluation by the Naval Air Systems Command.

The selection will be the best of the designs that have been submitted, and I believe the Secretary of Defense remarked the other day in committee that he would not be surprised to see the Navy select the other contractor. We did not feel constrained to select only the F–16 or a derivative of that design, mainly because of the amount of dialog that is going on between the Defense Department and the Congress in the matter of the selection of the fighter.

NAVY PECULIAR CHANGES

Senator GOLDWATER. On these design changes, are they the usual changes required for shipboard takeoff and landing?

Admiral HOUSER. Principally, they are, Senator. They are the requirements to land slower and be able to take off slower, to be structurally sound enough to be able to have the fuel that we need for our missions, because we do not have the large tankers available.

There are some mission changes in weapons selection. We have had a rather detailed study with the Air Force on their requirements and our requirements. They visualize their use of the airplane somewhat differently than ours. Theirs is an augment to their F–15 force which has not been curtailed. We believe ours will have to do somewhat more independent operations than just be an adjunct to the F–14.

Senator GOLDWATER. The approach speeds of both would fall within the parameters of your [deleted] would they not?

Admiral HOUSER. Yes, sir. The Naval Air Systems Command is working with the contractors right now on the approach speeds for these airplanes to see that they will be within acceptable limits.

POTENTIAL NACF PROCUREMENT

Senator GOLDWATER. How many air combat fighters are planned for your inventory?

Admiral HOUSER. We use the number 600 to 800, Senator. It really depends on how long we buy the airplanes. The total buy is a sort of misleading thing. Here you saw the number [deleted]. This envisages procurement at a fairly large rate through the early 1990's, after all the F–4's are phased out and the A–7's are phased out. Whether this actually occurs or not, I do not know, but I would say 600 to 800 would be a good estimate.

Senator GOLDWATER. How many squadrons will that number of ACF's support?

Admiral HOUSER. About 42.

Senator GOLDWATER. Forty-two. I got about 50. I guess the rest would go for training.

Admiral HOUSER. I did not count the training squadrons.

Senator GOLDWATER. That comes fairly close to your 12-airplane squadrons?

Admiral HOUSER. Yes, sir, it would be fairly close t o the 12-airplane squadrons.

Senator GOLDWATER. Is the requirement for that number of ACF's based on the assumption that only 334 F–14's will be bought?

Admiral HOUSER. Yes, sir. It is based on the assumption that our program will have 390 F–14's.

Senator GOLDWATER. How many attack carriers does that number of ACF's and your 390 F–14's assume?

Admiral HOUSER. An attack carrier force of 12 to 13, meaning this, if we have a 13th carrier, no air wing would be provided for it. So we are talking about 12 air wings fully equipped.

POTENTIAL NACF AIRPLANES

Senator GOLDWATER. Is the pending decision re the ACF one of three choices: F–16 derivative, F–17 derivative, or neither, meaning further development is required before an ACF selection?

Admiral HOUSER. Generally speaking, that is correct. The Secretary of Defense has told us to solicit proposals from both of the ACF contractors. They have sent in several designs of their airplane, but he has also specified us to tell whether neither would satisfy the Navy.

Senator GOLDWATER. Do these changes in design incorporate major changes, or merely what we are used to, putting the hook on and the weight?

Admiral HOUSER. They will be major changes, Senator, simply because the necessary structural weight is not in the basic ACF designs. The wings would probably have to be different to allow them to land more slowly. Perhaps some high lift devices would be installed, as well as internal larger fuel capacities.

SCHEDULE FOR DECISION

Senator GOLDWATER. I guess it is too early to give an answer, but does it look like a substantial increase in price over the land based version?

Admiral HOUSER. I think it is too early to respond to that question, Senator. That is under study now.

Senator GOLDWATER. When do you expect to reach a decision?

Admiral HOUSER. About the end of April or early May.

F–16 WITH F–401 ENGINE

Senator GOLDWATER. Would the F–16 derivative require the F–401 engine?

Admiral HOUSER. The designs are now under study. One of the responses that was given to the presolicitation notice which Captain Halleland had was with the F–401 engine. The Air Force uses the F–100 engine, and a naval design was submitted of that configuration, but the other designs are now in study, so there will probably be several designs.

Senator GOLDWATER. I know last year the conference limited the money for the F–401 to $4.6 million, and no further expenditures without some need being shown.

Admiral HOUSER. That is correct.

Senator GOLDWATER. With regard to that, do you have any estimate as to the amount of money required to complete the F–401 engine development program?

Admiral HOUSER. A number of estimates have been made, ranging from $80 million to $120 million.

SINGLE- VERSUS TWIN-ENGINE ISSUE

Senator GOLDWATER. Well, this is just a question that comes. The Navy's seeming dependence—well, not dependence but insistence, on two engines on overwater flights, will that have a big bearing on your decision?

Admiral HOUSER. It should not, Senator. It is a consideration, but we have operated a number of single-engine airplanes from our ships. As a matter of fact, the light attack airplanes, A–7, is single engine, the A–4 is single engine, the F–8 Crusader is a single-engine fighter. So we have operated a number of these.

The savings which would accrue to us from the twin engine safety and reliability will be cranked into the evaluation, but we have not insisted it be put into the design.

Senator GOLDWATER. That is pretty low loss factor, is it not, about 1 percent?

Admiral HOUSER. It is a low factor, however I think it is slightly more than that. Airplanes come cheaper with single engines, generally speaking, so therefore, if you are talking about money, you can afford to lose single-engine versions and not spend any more money for the inventory. The jet engine has, of course, proved to be quite reliable, and we believe that either single-engine or twin-engine airplane would be satisfactory.

ENGINE-CAUSED LOSS RATES

Senator GOLDWATER. What has been the Navy's experience on jet engine losses?

Admiral HOUSER. In peacetime the aircraft lost from engine causes are considerably higher in single engine than twin engine. I think on the order of three to four times. In combat we think it is about a wash. There are fewer vulnerable areas in a single-engine design, fewer lines connecting the fuel pumps and so forth, and there were not many cases when the twin-engine design was able to come home because of the one engine being shot out and the other still functioning. Very frequently when the engine was shot out, the damage spread and the aircraft was lost.

Senator GOLDWATER. Could you supply for the record—I do not imagine you have it—your loss figure based solely on engine failures, overall, peace and war.

Admiral HOUSER. I will, sir.

Senator GOLDWATER. That is all I have.

Do you have any questions?

Mr. CROMWELL. Yes, sir.

Senator GOLDWATER. We will go on with these questions and then come back at 1400 with the Marines. I am going to have to go over to the floor, but I want to thank you gentlemen.

STATUS OF NAVY DECISION ON NACF

Mr. CROMWELL. Admiral Houser, is the Navy going to go ahead with an NACF in fiscal 1976?

Admiral HOUSER. Yes; the plans are to do that and the money is in the budget for that purpose.

Mr. CROMWELL. Can you assure the committee that the Navy will go ahead with an NACF?

Admiral HOUSER. No. This depends on the evaluation that comes out of the Naval Air Systems Command shortly.

Mr. CROMWELL. There is a scheduling problem here. The committee is going to report its bill to the floor for fiscal 1976 by May 15, in accordance with the recently passed Budget Reform Act. As I gather the thrust of the testimony here today, the Navy is not going to make a decision on whether it is even going to go ahead with an NACF until sometime in May, and this is going to cause problems in that I do not think this committee is going to authorize $110 million for a program which the Navy will not even tell us that they are going to go ahead with.

Do you see the scheduling problem?

Admiral HOUSER. I do indeed, and I regret that it has occurred. We will try to get to you as promptly as we can the results of the selection so that it will be available in time for the authorization bill. The question as to whether or not the Navy is going to pursue the naval air combat fighter program is that we will, unless there is good reason not to—meaning if the designs are not satisfactory; but we fully intend to pursue this program.

NAVY HAS COMPLETED EARLY EVALUATIONS

Mr. CROMWELL. Has the Navy not already completed an early evaluation of the proposals?

Admiral HOUSER. We have. They are in the process at this time, and we have completed an initial evaluation.

Mr. CROMWELL. Did any or all of the proposals meet the Navy's requirements?

Admiral HOUSER. I would like to defer on that question. The evaluation is still going on, and I would ask Admiral Lee, if he would like to make any comments, or if he preferred that we just wait.

Admiral LEE. I could make some brief comments.

I think Captain Halleland went over the status of NACF in his presentation. He pointed out that we received proposals in early December, the initial proposals, but they were only partial. Then we received finally the complete proposals, including cost proposals, in early January, and we completed an interim assessment of these two contractors' proposals, and then we had technical discussion.

Captain HALLELAND. January 26.

Admiral LEE. January 26. We completed our interim assessment of these proposals, and then January 15 and 16 we held technical discus-

sions with both companies. These technical discussions are part of the standard procedure where you look at what is proposed, evaluate it and then go back to the contractors and say this is what we seek. At that time they have a chance to make corrections to their proposals.

On March 3, as Captain Halleland pointed out, we receive these additional corrections to their proposals and about a week or so ago we completed the assessment of these proposals. Meantime, we have another aircraft which was proposed by LTV and we have not completed its evaluation yet. To answer your question, we hope to have completed this source selection by the first of May and have made our recommendations to the Secretary of Defense. Obviously since we are in source selection, I do not feel free—members of the Source Selection Advisory Council sign nondisclosure certificates with regard to the competition and we are not supposed to discuss the contractors' proposals in detail outside of the Source Selection Council. But I think what we have said is that by May 1 we hope to have evaluated the proposals and recommended a selection to the Secretary of Defense.

DISTINCTION BETWEEN PROGRAM DECISION AND SOURCE SELECTION

Mr. CROMWELL. I appreciate that you cannot tell me who is winning the competition at this point in time, nor what your specific evaluations of the proposals are, but on the other hand, I think we ought to draw a distinction between making a source selection, picking the winning contractor, and making a program decision on whether you think one or both of these proposals will end up being good enough for the Navy to say yes, by golly, we are going to make a decision and we are going to go ahead.

Admiral LEE. Maybe I could tell you this. At this particular point in time, that is at the final assessments which took place a week ago Friday, at that point we had made a commitment to either continue both competitors, that is, both contractors, to a best and final, or eliminate either one or both if their decisions were unsatisfactory and could not be made satisfactory. At this time we are continuing both contractors to a best and final offer. That should give you some indication that we hope to have a successful bid.

Mr. CROMWELL. You have not addressed my distinction I was trying to make between picking a winning source and making the decision to go ahead with the program based on the preliminary evaluation. Would it not be possible to come back to the Congress fairly soon and say yes, we are going to go ahead with an NACF program based on our evaluations which show that one or both is going to meet our requirements?

Admiral LEE. Did you see the letter that Mr. Clements signed to the committee?

Mr. CROMWELL. I have it right here and I would like to put it in the record at this point, and I think it is very vague. He leaves us sitting here with no information and no decision.

The letter says in essense, we will let you know some time in May whether or not we are going to go ahead and spend the money in the 1976 budget on the NACF, or whether we are just going to go back and get a fresh start after this committee has made its decision on whether or not to fund the program.

[The letter follows:]

THE DEPUTY SECRETARY OF DEFENSE,
Washington, D.C., March 7, 1975.

Hon. JOHN C. STENNIS,
Chairman, Committee on Armed Services,
U.S. Senate.

DEAR MR. CHAIRMAN: I am writing to inform you of the current status of the Navy's evaluation for its Air Combat Fighter (NACF). At the time of the Air Force ACF selection last month the Navy's own evaluation was still in its early stages. In view of the considerable investment already made toward the design of derivative aircraft by two contractors we have instructed the Navy to complete its evaluation of both firms' proposals in a fully competitive atmosphere. As stated in testimony before the House Armed Services Committee on 19 February the Navy has been given complete freedom to evaluate and recommend its choice on this basis.

The Navy expects to present the results of its evaluation in early May. If none of the proposed designs can satisfy the solicitation criteria we will terminate the present competition and perform further trade off analysis of stated requirements in an attempt to meet the desired goal of a lower cost alternative fighter-attack aircraft for Navy use. If any or all of the derivative designs are acceptable the Navy will likewise recommend its choice.

Should an acceptable design be found it will be necessary to use the remainder of the present appropriation to contract with the selected firm to refine its design and sustain its engineering effort pending formal program approval to undertake full scale development in FY 1976. I believe this is a prudent course of action whichever firm is selected and I would appreciate your concurrence. We will also advise you should the evaluation disclose a need to revise our current budget figure for this aircraft in light of the considerable redirection which has overtaken its original submission.

Sincerely,

W. P. CLEMENT.

Admiral HOUSER. What we will try to do, Mr. Cromwell, is get some information from the Secretary of Defense to you before this is needed by the committee. I think the point is, that there are lots of hurdles to jump in the course of the NACF, not only selection, but also in getting approval; and if the program is not approved, the money of course would not be spent. But as Admiral Lee has said, we have high confidence that we can get a successful design.

Mr. CROMWELL. It would appear to me that the Navy could have enough information at this point in time, based on its evaluation work that has been done, to say whether or not you are going ahead with the program, and to recommend to the Secretary of Defense, or within the Defense Department, that everybody sign up for the program.

CONGRESS NOT SOURCE SELECTION AUTHORITY

Congress does not get into the source selection business. That is the Navy's decision, and the Secretary of Defense's decision, as to who is the winner.

Admiral HOUSER. Well, clearly when we got into the program and put the money in the budget, we expected to go ahead with it. The only distinction we would make here is if neither design would be wholly satisfactory, of course, we would not pursue an unsatisfactory design.

Mr. CROMWELL. The Clements letter leaves it totally up in the air as to whether at this point in time the Navy finds either or both is not acceptable.

PREPARED QUESTIONS FROM SENATOR CANNON

I have got some additional questions for the record which I would like to put in.

[Questions submitted by Senator Cannon. Answers supplied by Department of the Navy.]

Question. Admiral Houser, the Navy's aircraft procurement budget request for FY 1976 is $3.077 billion, an increase of $220 million from last year's $2.780 billion. This is an increase of 8 percent. Which programs or budget areas count for the major increases and offsetting decreases from last year?

Answer. This increase is mainly attributable to a move to APN of approximately $60 million modification installations funds formerly budgeted in O. & M.N., and the remainder is escalation. The O. & M.N. funds were moved to APN to cover installation of those modifications performed by a contractor at his plant.

Question. Admiral Houser, taking a similar look at the Navy missile procurement budget request, the FY 1976 budget asks for $1,224 billion, an increase of $489 million, or 67 percent, over last year's $735 million.

Can you give us a rundown on where the major changes are in the missile procurement category?

Answer. The figures that you quoted relate to the entire WPN appropriation and include funding for torpedoes and guns. The FY 1975 budget includes $532.3 million for missile procurement. This compares with our FY 1976 request of $1,000.5, an increase of $568.2 million. This increase is primarily the result of increased funding requirements for five different missiles. The largest single increase is for the Trident I missile which requires $224.4 million more in FY 1976 than requested in the FY 1975 budget. The remaining increase of $243.8 million is requested for initial or increased production of the Sidewinder "L," Condor, Harpoon, and the SM–2 version of the Standard ER Missiles.

Question. Now, in the area of tactical missiles, which is of direct interest to this Subcommittee's budget review, where are your biggest changes since last year?

Answer. The largest tactical missile changes are on the Sidewinder, Condor, Harpoon, and Standard ER. The Sidewinder increase of $26.4 is required to finance the first production of the new "L" version of the Sidewinder. The Condor increase of $85.6 million represents the first production increment for fleet use. The Harpoon has increased $62.6 million due to increased quantity procurement and a unit cost increase. The Standard ER program shows an increase of $47.4 million. This increase is required to procure 22 of the new SM–2 version of the Standard ER for operational evaluation.

Question. Your five year funding appears to be significantly lower than the figures that were in last year's budget presentation to us. What are the factors that drove these five year totals, in other words, was that an internal Navy allocation of funds or was it based on OSD decisions?

Answer. Several decisions by the Office of the Secretary of Defense during the last year have contributed to this decline. The two which had the largest effect were (1) the decision to consolidate all airlift functions under the U.S. Air Force thus deleteing all C–9, CT–39, CMX procurements in FY 1976 and out and (2) the decision to stop all procurement of A–6E aircraft after FY 1976.

Question. What is your five year aircraft procurement total on a year by year basis?

Answer.

SUMMARY—AIRCRAFT PROCUREMENT, NAVY

	Fiscal years					
	1976	197T	1977	1978	1979	1980
Quantity	338	75	294	193	213	217
Dollars in thousands	3,077	600	2,760	2,784	2,973	3,468

Question. This committee examines the various functional elements of tactical air power, including the combat aircraft, the fighters, and air-to-ground attack aircraft, and the combat support planes such as reconnaissance, electronic warfare jammers, radar warning airplanes, and tankers. Supporting these as well are tactical airlift. Your statement indicates that the Navy Carrier Air Wing includes aircraft that performs all of these functions and also have an additional mission that land tactical air does not perform, which is anti-submarine warfare.

Is this a complete summary of your carrier based aircraft mission types, and do you have any other comments on how you view your overall mission areas?

Answer. That is a complete summary of the carrier based mission types and I believe we have amply discussed the overall mission areas.

Question. On the carrier swing concept, what operational CV deployments have been made so far, and what have you found out about the CV concept from them?

Answer. There have been five operational CV deployments to date. The results have been gratifying and we have proven that the antisubmarine warfare mission can be conducted in conjunction with strike operations. The carriers deployed to the Mediterranean have successfully "swung the wing" to balance the deck load for specific operations. This has been accomplished by leaving up to [deleted] fighter and attack aircraft plus crews in CONUS bases when the ship deploys and flying them to the ship when called. We have learned that the aircraft can be aboard the carrier within [deleted] of notification.

Question. I understand that the carrier skippers and air group commanders are somewhat disenchanted with CV operations. Would you give us an explanation of what they do not like about the CV concept?

Answer. I believe the initial reluctance to accept the CV Concept has disappeared. Rear Admiral Davis, who commanded the carrier group in which *Kitty Hawk* operated as a CV, was most enthusiastic about the concept. The two former CV air wing commanders on my staff have not indicated disenchantment with the concept. On the contrary, I believe our carrier skippers and air wing commanders are well aware of the requirement to be able to conduct all phases of war-at-sea from the limited number of carriers in the fleet. The CV Concept is providing them with this capability.

Question. Would you describe the typical deployment cycle for an air wing and explain the impact of this on individual personnel. What I want you to tell us is how much of the time an individual officer or airman spends at his home base, during workup for a deployment, and then away when the carrier actually deploys.

Answer. The average length of carrier deployments is seven months. In addition the carriers spend considerable time at sea between cruises conducting carrier qualifications, fleet exercises and predeployment operations. The historical average over the past three years reflects that the carriers spend 70% of their time away from home port. The air wing averages an additional three weeks away from home conducting weapons training deployments. Air wing personnel average approximately three of every twelve months in home port.

Question. What impact does this cycle have on morale, retention, rates, and reenlistments?

Answer. The Navy's reenlistment rates are up at the present. This probably is influenced by the lack of opportunities in the civilian sector where unemployment rates are up. Long separations from families have been given as the principal reason for men not reenlisting or remaining in the Navy. During the Vietnam War, air crews and carrier crews would experience 80–85% of their time away from families. Morale and retention was adversely affected. To improve these situations, the Navy is trying, in the post-Vietnam tempo, to adjust schedules to provide more time in home ports.

Question. You have alluded in a rather general way to impending shortfall of fighters in the Navy and Marine Corps inventory in the 1980 timeframe. Can you give us a more specfic quantitative explanation regarding this potential inventory problem?

Answer. Projected fighter shortfalls will be [deleted] in FY–80 [deleted] in FY–81, and [deleted] in FY–82. We anticipate filling the shortfalls with the NACF subsequent to [deleted.]

Question. What has been your actual loss rate of fighters in calendar 1973 and 1974, since the Southeast Asia War ended?

How does the actual loss rate experienced compare with your planning projections?

Answer. The loss rate of fighters, as you requested, expressed as a percentage of operating aircraft is:

Calendar year 1973		Calendar year 1974	
Actual	Planned projection	Actual	Planned projection
[Deleted]		[Deleted]	

Question. How many carriers will have been modified to support F–14s through the FY 1976 funded delivery period?

Answer. There will be four carriers modified to support F–14's through the FY–1976 period USS *Enterprise* (CVAN–65), USS *Kennedy* (CV–67), USS *America* (CVA–66), and USS *Constellation* (CVA–64).

Question. Has the F–4B to F–4N modification been completed?

Answer. The F–4B to F–4N modification is not yet complete. The total program calls for the conversion of 228 aircraft; to date 143 aircraft have been inducted. The last F–4N is expected to be completed in late Fiscal Year 1977.

Question. Would you describe in more detail your plan to modify 302 F–4Js to the F–4S?

In other words, we want to know whether this is just a structural rework program or if significant equipment modifications will also be included.

Answer. The F–4J to F–4S modification or Conversion In Lieu of Procurement program includes rewiring and configuration update as well as structural fatigue improvements. Included in the configuration update are:

AWG–10 weapons system maintainability and reliability improvements.

Environmental Control System modification to increase weapons control and radar system cooling capacity.

Question. The Air Force has modified its F–4Es with leading edge slats and they have told us that this greatly improves the dogfight capability of their planes. Will the Navy be adding leading edge slats to the F–4Js during that modification program?

Answer. No, slat installation is not presently scheduled.

Question. Do you believe that the leading edge slats are needed for dogfighting?

Answer. Yes, F–4 tactical maneuverability increases significantly with the addition of leading edge slats. Without slats, the F–4 manuevering performance is [deleted] and pilots must exploit other factors to gain a tactical advantage.

The Navy has tested and fully endorses leading edge slats as the only reasonable means of improving F–4 maneuvering performance. The original plan to install slats in Navy F–4's was held in abeyance in anticipation of a larger F–14 inventory and a resultant retirement of the F–4 from fleet use.

The Navy is now faced with the fact that the F–4 will continue to comprise a large percentage of its fleet fighter inventory until the mid to late 1980s. We think that slats are required in the F–4 to give it competitive dogfight capability during the next ten years of service.

Question. How long will these 302 modified F–4's stay in the active and reserve inventory?

Answer. The F–4s aircraft will be in the active force through [deleted.] How long the aircraft will remain in the Reserves will depend on the NACF program. The F–4s' service life expires in [deleted.]

Question. Turning now to the attack aircraft procurement, the FYDP budget program shows the A–6E procurement ending with the 12 that are in this year's budget request. There were stories in Aviation Week magazine and other publications toward the end of 1974 which indicated that the Navy planning for A–6E procurement in FY 1976 had been rejected by OSD. Would you tell us if the stories were correct and what the situation is regarding continuing A–6E procurement beyond FY 1976?

Answer. The FY–1976 procurement was removed from the FY–1976 budget by OSD at one point; however, it was later reinstated by the Secretary of Defense. This is the last year of A–6 procurement currently authorized by OSD.

Question. General Armstrong, were the Marines going to lose their A–6E force under the OSD plan?

Answer. Inherent in any decision making process is a thorough examination of alternatives. This apparently was one alternative involved in the OSD decision which resulted in the decision to terminate A–6E procurement with the FY76 request. In its final form, the OSD plan directed that the Department of the Navy reallocate the remaining A–6 assets and distribute outyear A–6 force level reductions between Navy and Marine Corps. This distribution has been accomplished to the mutual agreement of both the Navy and Marine Corps.

Question. Would you explain further regarding whether you have or have not requested retention of the A–6 all-weather mission?

Answer. Senator, we have urgently requested retention of the all-weather mission. We view the capability to conduct day and night missions under all-weather conditions as a vital requirement for both the Navy and the Marine Corps.

Question. Would you explain the inventory requirement for Navy and Marine Corps A–6s, tell us where and when you have an inventory force level problem in supporting these squadrons, explain the planning and the actual attrition that is being experienced, and justify precisely when you get into an inventory shortfall with A–6s. Since KA–6 tankers also affect this question, include them in your analysis.

Answer. The inventory requirement for the Navy and Marine Corps A–6 force levels is [deleted] and is generated as follows:

Navy squadrons—12 with 12 aircraft each	144
Navy training—[deleted]	[deleted]
USMC squadrons—5 with 12 aircraft each	60
USMC training—[deleted]	[deleted]
Other—R.D.T. & E	2
Operating	[deleted]
Pipeline—[deleted] of operating	[deleted]
Inventory objective	[deleted]

With the Fiscal Year 1976 request for 12 production A–6E's and the 36 A–6A to A–6E Conversion in Lieu of Procurement, the A–6E inventory is predicted as follows:

A–6E DELIVERIES TO FLEET

	Fiscal years							
	1975 and prior	1976	197T	1977	1978	1979	1980	1981
New production	64	12	3	12	3			
A to E CILOP	96	41	9	30	34	18		
Cumulative totals	160	213	225	267	304	322		

The attrition factors which are derived from prior years experience are then applied. The Fiscal Year 1976 submission has an attrition factor of [deleted] percent of operating as follows:

	Fiscal years							
	1975 and prior	1976	197T	1977	1978	1979	1980	1981
Cumulative totals	160	213	225	267	304	322	.....	
Yearly attrition	−5	−6	−2	−7	} [Deleted].			
Cumulative attrition	[1] −6	−11	−13	−20				
Inventory	154	202	212	247				

[1] One A–6E was lost in prior year.

This indicates that in Fiscal Year 1979 we come the closest to achieving our inventory objective. Over the past year we have been experiencing a downward trend in attrition. An attrition rate of [deleted] percent would save the Department of the Navy [deleted] aircraft a year. Each year prior to our budget submit, the attrition factors are adjusted, and I am confident the A–6 attrition factors will decline. All predictions indicate an A–6 inventory shortfall subsequent to Fiscal Year [deleted] I have only addressed the A–6E inventory, as all A–6A/B/C aircraft will have been converted to A–6E's or KA–6D's by Fiscal Year 1978.

The KA–6D tanker inventory requirement is as follows:

Navy squadrons—12 with 4 aircraft each	48
Navy training	[deleted]
Operations	[deleted]
Pipeline [deleted]	[deleted]
Inventory objective	[deleted]

Our current inventory with the [deleted] percent attrition factor applied is as follows:

	Fiscal years							
	1975 and prior	1976	197T	1977	1978	1979	1980	1981
KA–6D	56	.....		}				
New conversion	+8	.....		[1]				
Attrition	−2	−2	.....	−2	} [Deleted].			
Totals	62	60	.....	58				

[1] Additional tankers conversions will undoubtedly be in the future year submits depending upon attrition and the status of the A–6E production in fiscal year 1977 and subsequent.

Question. Does the Navy have a replacement aircraft planned and/or programmed to be the follow-on to the A–6?

What is your long range planning?

Answer. The Navy does not have a replacement aircraft planned nor programmed for a follow-on to the A–6. However, in the Fiscal Year 1976 Research, Development, Test and Evaluation submit under Program Element 632XX All-Weather Attack, there is a Project W11RR Advanced Modular All-Weather Attack System which will address system definiton for a system to be placed in an existing aircraft or a new all-weather attack aircraft.

Question. What is the minimum production sustaining rate that would be reasonable for the A–6E?

Answer. The minimum reasonable sustaining rate is about 12 aircraft per year.

Question. If the present planning was changed and you were to buy more A–6Es in FY 1977, would you need long lead funds this year, and if so, how much?

Answer. Yes. We would need $14.3 million.

Question. Regarding the A–7E squadrons, you said that two carriers had [deleted] squadrons per deck but that all others had [deleted] squadrons per deck. Is the difference caused by the actual physical size of the carrier or do fiscal constraints limit the number of A–7 squadrons?

Answer. The original plan was to operate [deleted] A–7E squadrons on CVAN–65 and subsequent class carriers which have larger capacity for operating aircraft than the earlier carriers. Fiscal constraints limited the program to [deleted] squadrons per carrier plus [deleted] additional squadrons which can be inserted on any one of the large decks as the situation demands.

Question. On early warning, if the Navy changes its E–2C deployment program from four per carrier to [deleted] per carrier, what total procurement quantity will be required to support that force and when will that quantity be bought under the present E–2C procurement plan?

Answer. If the [deleted] per carrier concept proves acceptable our current procurement plan of [deleted] aircraft through Fiscal Year 1979 will enable us to meet the inventory objective is Fiscal Year 1981. An advanced attrition buy will also be required to maintain force levels. I must stress however that the [deleted] aircraft per wing is simply an idea at this stage. The fleet commanders have requested four. Our investigation into the feasibility of [deleted] per wing should be completed within the next year.

Question. General Armstrong, do the Marines have any airborne early warning airplanes?

How do you accomplish the radar surveillance function of tactical warfare?

Answer. No sir. The Marines do not have airborne early warning airplanes.

The radar surveillance function is primarily accomplished by ground based surveillance radars. The ground system is augmented, depending on the operational situation, by the use of CAP aircraft to provide the low altitude, long range surveillance and warning. In this respect, a fringe benefit of the F–14 surveillance capabilities will be its two-way data link with our ground based units resulting in a greatly increased capability against long range, low altitude targets.

Question. On reconnaissance, Admiral Houser, your statement indicates that the RA–5Cs will run out of service life beginning in FY 1976 and that that is the reason the RA–5Cs will be retired by FY 1980. It was my impression that the Navy bought RA–5Cs in 1968 and 1969. This would mean that they were of more recent vintage than even your latest F–4s, the ones which you are planning to update and keep in your inventory through the 1980s. Why are the RA–5Cs running out of service life so soon?

Answer. A total of only 36 RA–5C's were purchased under the fiscal year 1968 and fiscal year 1969 contracts. Eleven of the 36 have been stricken through a combination of accident and combat losses. It should be noted here that these aircraft, although produced in 1969 and 1970, contain avionics systems and sensors that represent the technology of the late 1950's and early 1960's. They were produced in response to wartime attrition and did not reflect the then-current state-of-the-art. They are obsolescent, difficult to maintain, and very costly to operate. Our total active force of RA–5C's consists of the [deleted] older aircraft that have been modified to the new configuration, and [deleted] older unmodified aircraft that will be retired in June of this year. Attrition alone will preclude reliance on these aircraft as a major element in our reconnaissance force past the end of this decade. Reactivation of stored aircraft to augment this limited force would be quite expensive and would only serve to extend on already obsolescent weapons system.

Question. What is the status of your carrier-based airlift, or COD program?

Answer. During the past year, the Navy thoroughly studied 26 possible candidate systems, including commercial variants, and determined that the most cost-effective alternative is a minimum modified, carrier suitable and logistically supported S–3A. On 28 March 1975, the Deputy Secretary of Defense recommended that the Navy procure a limited number of stripped S–3 aircraft, including the procurement of wing mounted pods, to provide the needed long range aerial resupply capability to augment current C–1A and C–2A assets. This direction enables the Navy to overcome present inadequacies and projected deficiencies. The

authorization to proceed with this program is contingent upon obtaining Congressional authority for program initiation. However, the required long lead funding is not included in the President's Budget; consequently, revisions to the procurement funding may be required to affect an economical buy. Funding of $12.9M in FY 1976 and $10.8M in FY 197T is required to prevent a line break with the FY 1976 S–3A production.

Question. The Navy recently completed negotiations for the FY 1975 procurement of F–14 aircraft at a price about $23 million over the FY 1975 budget amount of $325 million for 50 aircraft. What are the reasons for this higher price and in what areas were the costs negotiated higher than anticipated?

Answer. The FY–75 contract was awarded on 31 Dec. 1974 for $348 million. This exceeds the FY–75 airframe budget by $23 million. The increase is primarily attributable to a production manhour increase associated with the Nov. 73–Jan. 74 efforts to recover schedule and meet deployment committments with uniformly configured aircraft. Unbudgeted Grumman wage adjustments/cost of living increases also contributed to the increase.

Question. Commander Strole, would you describe the practice dogfight between the F–14 and the Marine Harriers that took place in the Philippines and tell us what the results were?

Answer. Let me stress at the outset that the objective of the flights was training, and it was not an evaluation to determine which aircraft was superior. Further, should the F–14 engage Harrier-like threat aircraft, and I am not aware of any, but should the F–14 engage them, our tactics would be high energy slashing attacks that would preempt the Harrier slow speed capabilities, and the F–14 would dominate—would win.

Fighter Squadrons ONE and TWO flew a total of ten training sorties from the USS *Enterprise* off Cubi Point against VMA–513's Harriers based ashore at Naval Air Station, Cubi Point. The primary objective of the dissimilar air combat maneuvering was training in a close-in environment on a "see and be seen" basis to compare unique qualities of both aircraft from offensive and defensive positions that were, at times, less than ideal for either.

Of the sixteen total engagements flown by ten different aircrews, the Harrier's aircrews won six, the Tomcats gained an advantage in three, and seven were considered as a draw. In spite of a very limited weapons system and existing airframe power-plant restrictions, the Harrier has a formidable subsonic air combat capability enhanced by exceptional acceleration and deceleration rates and slow speed maneuverability.

No attempt was made to standardize the F–14 tactics to be flown against the Harrier. None of the F–14 crews had fought an AV–8 before; thus, several different tactics were tried. Both squadrons felt that with additional air combat maneuvering opportunities, they would develop the tactics and proficiency to successfully defeat an AV–8 type aircraft.

Question. I understand that the Navy negotiated a firm fixed price contract for the FY 1975 procurement of F–14 aircraft, however, the Navy also negotiated contractual condition which provides for an escalation allowance in addition to the firm fixed price. How and when will the Navy know how much they will have to pay for the F–14 aircraft in the FY 1975 program without any agreed to ceiling price?

Answer. The last of the three adjustments is made in January 1977 at which time the Navy will know the price of the FY 1975 procurement of F–14 aircraft.

Question. How does the Navy plan to fund this extra charge for escalation and is there any money in the FY 1976 budget to cover this potential unfunded deficiency in the F–14 program?

Answer. It is entirely possible that Government efforts aimed at economic stabilization will result in an annual economic growth rate of 6% or less over the next few years. If this materializes either a downward economic adjustment or no economic adjustment to the contract will result. The FY–76 F–14 budget does not include funding required in the event that the FY–76 airframe contract economic escalation indexes exceed 6%.

Question. I understand that the terms of the contract for the FY 1975 procurement of F–14 aircraft allow that escalation will be paid at varying intervals

during production against a preestablished fixed dollar amount. This could provide a windfall profit to the contractor by paying escalation allowance on costs that are not even incurred. Why did the Navy allow this provision without limiting the allowance for escalation to apply only against actual costs that are incurred by the contractor?

Answer. Any adjustment whether upward or downward under the Economic Price Adjustment Provision is unaffected by the actual incurred hours or costs. As a result, the motivation of the contractor to effectively control costs through the judicious expenditure of hours is not minimized by this clause. It is not considered appropriate to treat reductions in hours differently from increases in hours in a fixed price type contract. The production labor hours were projected by NAVAIR on a 76.5% improvement curve which represents very "tight" pricing and will be very difficult to achieve. Based on actual data through January 1975 approximately a 77.5% curve is being experienced. In production programs such as the F–14, curves in excess of 80% are normal.

Question. I also understand that the Navy allowed that the escalation rates would be based on a New York/New Jersey consumer price index and that this index would be applied against some work performed for this program at the contractors' Florida facility. Because of the possible wage differential in these localities, this also could provide some benefit to the contractor. Why would the Navy allow this apparent impropriety in its contract negotiations?

Answer. The work at the Stuart, Florida facility wasn't treated separately for the following reasons: (1) calculations are based on relative changes of the index, not on the actual wage rate, (2) no CPI rate exists for Stuart, or its immediate area. The alternative would have been to use the U.S. nationwide index, (3) Stuart represents only 1.4% of the total effort.

Question. Has the Navy provided in their contract negotiations that all work effort and costs that can be identified as directly related to the Iranian procurement of F–14 aircraft are charged to the Iran Program or are there some allocations of Iranian included costs to U.S. programs?

Answer. The Navy has charged to the Iranian procurement all work effort and costs that can be identified as directly related to the Iranian program. F–14 aircraft for the U.S. Navy FY–75 requirements and the Foreign Military Sale (FMS) to Iran of 30 F–14 aircraft, the majority of which are to be delivered in CY 1976. were proposed and negotiated concurrently in order to achieve the benefits of a larger quantity and a higher production rate.

The pricing technique employs an averaging-of-cost approach which apportions to each program cost (price) on a prorata basis *after* removing from the negotiated price, those items considered unique to the requirements of one of the countries, (i.e., configuration control and unique tactical tape development for Iran). This approach is consistent with that utilized in other programs where FMS and Navy procurements for the same aircraft are priced and produced concurrently. Further, this approach has been considered by the DCAA auditors as appropriate, consistent with past practices and reasonable. This approach also avoids inequities, real or apparent, which would result by a technique permitting the Navy aircraft to reap all of the benefits of a concurrent buy while selectively disallowing additional cost necessary in generating such benefits.

Question. Has the cost of the Iranian procurement of 50 F–14 aircraft increased significantly and has the scheduled delivery of these Iranian aircraft been slipped? What is the Navy's estimate of the increased cost of the Iranian procurement of 50 aircraft and what is the extent of slippage in deliveries?

Answer. Yes sir, the cost of the 50 Iranian F–14 procurement will increase as result of lowering the production rate to 6/month from 8/month and slippage of aircraft deliveries approximately six months. At this time the Navy is analyzing the cost impact associated with these program changes.

Question. Has the Iranian Government been appraised of these increased cost and delivery slippage and is this acceptable? What would be the effect on the Navy program if the Iranians refused to accept the delay in deliveries?

Answer. The Iranian Government has been officially notified concerning the aircraft delivery slippage. The eventual cost impact to Iran is still under review. The Iranian Government has not commented concerning the schedule slippage

or potential cost impact subsequent to official notification. However, we have no reason to believe that the Government of Iran will refuse to accept the delay in deliveries.

Question. Is the Navy completely satisfied that the Phoenix missile system will provide the operational capability required when firing six Phoenix against six targets, and four Phoenix against four targets? How many times has the Navy test fired the Phoenix missile in this six or four missile configuration test and what were the results?

Answer. The Navy is completely satisfied with the multiple detection, acquisition, launch and tracking operational capability of the Phoenix missile system as demonstrated by a 4 Phoenix missile firing against a formation of 5 targets in Dec. 1972 and a 6 Phoenix missile firing against a formation of 6 targets in Nov. 1973. The results of these two missile missions were 8 successful missile/target intercepts, 1 missile failure and 1 no test. These historical "firsts" coupled with the unprecedented launch success rate achieved to date are most gratifying.

Question. The Navy's original reliability goal for the AWG–9 fire control system for the F–14 aircraft was established at 33 hours mean time between failure. What reliability has the Navy demonstrated to date for this system?

Answer. The Navy has demonstrated a mean time between mission essential failures (MTBF) of greater than 22 hours. This satisfies prior contractual requirements.

Question. How much money is the Navy requesting in FY 1976 to further improve the reliability of the AWG–9 fire control system and what is the reliability requirement that the Navy would expect to attain for this expenditure?

Answer. $3.3 Million is identified for AWG–9 R&M improvements in FY 1976. This amount represents the first increment of funding required to improve those dedicated shop replaceable assemblies (SRA's) that have proven most in need of improvement. It is expected that incorporation of the improved SRA's will increase AWG–9 system reliability to approximately 25 hours MTBF.

Question. The NACF was originated by this Subcommittee. Last year the House Appropriations Committee dictated that the NACF be a Navy version of the Air Force ACF. Currently both General Dynamics and Northrop are competing for the Navy contract.

Question. What are the major NACF differences from the Air Force ACF?

Answer. The major differences are in the structural strength required for a carrier suitable aircraft and the weapon system suit required to perform the Navy missions assigned to the NACF.

Question. What other proposal information has been solicited and received from the contractors since December, January, other than the General Dynamics and Northrop NACF proposals?

Answer. In February and March we received final technical and costing information from both competing teams. The General Dynamics–LTV team response was provided by LTV. The Northrop-McDonnell response was provided by McDonnell. In addition on the first of March we solicited proposals from the competing engine contractors, General Electric and Pratt and Whitney, for each engine in the competition.

Question. Has a preliminary evaluation been completed?

Answer. Preliminary evaluations of the proposed designs should be completed in March.

Question. Does the Navy have enough data to show whether or not the contractors will meet the minimum goals and the requirements of the RFP?

Answer. Since we are still in source selection, it would be inappropriate at this time to comment on the adequacy of the data submitted by the contractors. Our assessments to date indicate that both competitors' proposals are within the competitive range.

Question. Why is the Navy asking for a track-while scan radar system for the NACF?

Answer. The Navy specified track-while-scan as a desired feature in the NACF radar. This is not a requirement but would enhance its mission capability.

Question. How much extra does the track-while-scan radar system cost?

Answer. The addition of track-while-scan to the NACF radar will primarily impact the software development costs and can be provided for only a nominal increase in cost.

Question. Why are only ten airplanes planned for the first two years of production?

Answer. The timing of the development program, fiscal constraints, the materials long lead time of approximately thirty months, procurement of rate tooling and the desire to minimize development concurrency all contributed to the tentative plan for procuring only ten aircraft in the first two years.

Question. When will the Navy make a decision on whether or not it will proceed with an NACF program?

Answer. The Navy plans to complete this source selection by the first of May and make our recommendation to the Secretary of Defense.

Question. Making a program decision is a matter that is entirely different from selecting a winning contractor. Why can not a go or no-go decision be made before May?

Does the Navy not have enough evaluated information at this point in time to be able to make a decision on whether or not to start the program?

Answer. It would be unfair to the competing contractors if the Navy made any statements or commitments to the NACF program before the source selection process is completed. At this time we can say that we have high confidence that we can get a successful design and the program decision will be provided at the earliest possible time.

Question. How does the F–14's reliability record compare with the rest of your fleet aircraft?

Answer. A comparison of aircraft operational readiness rates reported by USS *Enterprise* for the period July through December 1974 disclosed that the F–14 is compiling a highly favorable readiness performance record in relation to other aircraft in that operating environment even though the aircraft with which it is being compared are considerably less complex and more mature than the F–14. Furthermore, we are extremely pleased to report that the F–14 is currently attaining readiness levels far above those experienced on previously introduced Navy fighter aircraft. We acknowledge that R&M Improvement of certain selected F–14 components is required to enhance system operations availability. (The FY 76 and TT budgets reflect our planning in this regard). However, given the complexity and capability of this weapon system the F–14 has produced an outstanding readiness performance record during its initial operational deployment.

Question. What is the status of the Iranian program? Has Iran signed up for all 80 aircraft and provided the funding?

Have the 80 Iranian airplanes been contracted for with Grumman?

When will the Iranian Airplanes be delivered?

Have the Iranians agreed to that delivery schedule?

Answer. The Government of Iran has signed Letters of Offer and Acceptance and is providing funding for 80 F–14 aircraft. 30 aircraft are included in the FY 75 contract. The remaining 50 aircraft will be included in the FY 76 contract. Iranian Aircraft will be delivered at a 2 per month rate during calendar year 76 and at a rate of 3 per month from January 77 through June/July 78. As discussed in a previous response, the Government of Iran has been officially notified concerning the aircraft delivery slippage.

Question. Are you holding the production rate essentially steady at six a month from January 1975 through March 1978 under this plan?

Answer. Yes, that is correct.

Question. What happens to the F–14 production rate after that time?

Answer. Production gradually declines to 3 per month at the end of 1978 and remains at that rate through 1979 at which time the rate is reduced to 2 per month through 1981.

Question. Is Grumman meeting the present F–14 delivery rate of six per month? Are they having problems doing so?

Answer. No. Grumman met the January 1975 contract schedule and had progressed all 6 of the February aircraft into final Navy Flight Acceptance on schedule. However, due to the impact of grounding the aircraft in January, a rash of flight discrepancies and poor weather in February, two aircraft were officially accepted by month's end and the remainder slipped into early March. Flow from final assembly to flight acceptance has, and is, on schedule at 6 per month and first flights for March aircraft have taken place very close to schedule. Barring unforeseen circumstances, the Navy is confident Grumman can regain schedule promptly and sustain the rate of 6 per month.

Question. What is your FY 1976 and '7T budget request for F–14s and Phoenix?

Answer. For FYs 76 and 7T we are requesting 45 aircraft and 340 missiles.

Question. Why are your advance buy finding requests increasing while the airplane quantity is decreasing?

Answer. Advance funding requests are based on long lead "turn-on" requirements and related hardware cost estimates. Decreasing quantities causing higher unit pricing in addition to increasing lead time requirements for unique items have resulted in higher advance funding requirements. In 1969 the F–14 was basically a 24 month lead time aircraft. That is, an F–14 aircraft would be delivered 24 months after the initial order was placed. Today, market conditions are causing some items to require as many as 43 months leadtime to insure performance to the current F–14 aircraft delivery schedule.

Question. Why did the airframe price go up last year over your budget planning estimate?

Answer. The FY 75 contract was awarded on 31 Dec 1974 for $348 million. This exceeds the FY75 airframe budget by $23 million. The increase is primarily attributable to a production manhour increase associated with the Nov 73–Jan 74 efforts to recover schedule and meet deployment commitments with uniformly configured aircraft. Unbudgeted Grumman wage adjustments/cost of living increases also contributed to the increase.

PREPARED QUESTIONS FROM SENATOR THURMOND

[Questions submitted by Senator Thurmond. Answers supplied by Department of the Navy.]

Question. Admiral Houser, as you know, the Senate Committee on Appropriations last August recommended a fly-off between the YF–16 and YF–17. I understand that only a paper study was made and a fly-off as such, was not conducted. Is that correct?

Answer. To my knowledge, there was no direct aerial engagement between the FY–16 and the FY–17.

Question. The Air Force has now selected the YF–16. Do you feel the Navy can make a proper decision without a fly-off?

Answer. Yes, sir, I do not feel the Navy requires a head-to-head test of the YP16 and YF17 to make a decision. These technological prototype aircraft are not combat aircraft. They are sensitive to configuration which is somewhat different from that of a Navy aircraft which is required to operate from carriers.

Question. What information could have been useful to the Navy in the decision process if a fly-off had been conducted?

Answer. No significant data would have been obtained in a head-to-head engagement of the lightweight fighter prototype YF–16 and YF–17 in regard to the Navy decision for a new aircraft.

Question. Admiral Houser, has there been any pressure from the Air Force or DOD on the Navy to make the same selection as the Air Force, i.e., the YF–16?

Answer. No, sir, there has been no pressure by either the Air Force or DOD for the Navy to select a variant of the YF–16 other than that directed in the

Joint Appropriations Committee reports of last fall. We are endeavoring to find the least cost design for an acceptable aircraft making maximum use of technology and hardware from the Air Force lightweight fighter and air combat fighter programs.

Question. Admiral Houser, what do you see as the two or three main differences in the requirement of the Air Force and the Navy for the Air Combat Fighter program?

Answer. Senator Thurmond, the Navy's primary NACF requirement that is different from the Air Force ACF is to perform Navy missions from carriers. Carrier operations require substantial difference in structural components than for aircraft that operate from runways. In addition, the basic Navy airplane must fill two missions, replacing the A–7 as well as some of the F–4's. Of course, it must be supportable with Navy equipments that are already on carriers compared to the Air Force equipments they use at their airfields. There is also a compelling need to utilize equipments that are already common to other Navy aircraft aboard the same ship in order to reduce support costs and storage requirements. The carrier aircraft requires more fuel because of the nature of carrier air warfare. As I previously mentioned, Senator, the Navy's ACF will be required to do more missions and without the support of other aircraft as envisioned for the Air Force Combat fighter.

Question. Admiral Houser, what do you see as the threat in the 1980's which you would use the Air Combat Fighter against?

Answer. Potential adversaries are increasing both numbers of their fighters and capabilities, particularly with respect to their weapons. Navy fighters must expect to be severely outnumbered in air combat engagements. I would expect missiles to be fired at us from beyond visual range by enemy fighters directed by improved fire control systems.

Question. Admiral, has the Navy done any studies on the threat of the 1980's and how loss rates might be postulated between the F–14 and the Air Combat Fighter?

Answer. Yes, Senator Thurmond, we have evaluated the loss rates projected for the F–14 against the threat. As part of the source selection and evaluation now in process, similar assessments will be made for the Navy Air Combat Fighter since combat loss rates and survivability are a function of design, performance and countermeasures suits.

Question. Admiral, what is your feeling about a single engine aircraft for the Navy mission?

Answer. Senator Thurmond, with the higher reliability of the modern jet engine and our experience of single engine aircraft operating from carriers, we feel that either single or twin engine aircraft can satisfy Navy mission requirements.

Question. Admiral, why are the Navy and the Air Force Air Combat Fighters planned with radars of different ranges although both aircraft have a designated air superiority mission?

Answer. The employment requirements of the ACF and NACF are different. The NACF will complement F–14 fighters of the Navy and Marine Corps and must be capable of engaging a numerically superior enemy under conditions of autonomous operation. Therefore, the NACF must be capable of both medium range and close-in aerial combat which requires a larger search and track radar volume than is required for the close-in fighting role of the USAF ACF.

Question. Admiral Houser, what is the purpose of stretching out the F–14 buy through FY 1980?

Answer. the Department of Defense (DOD) has opted to stretch deliveries in order to stabilize production of the F–14 over the long term rather than going through a sawtooth production pattern with its attendant take-on and layoff of labor force. This also permits DOD to maintain a solid production base for our national defense.

Question. Admiral, has the Navy ever calculated what savings could be realized if the program were bought out in three years instead of five years?

Answer. Yes Sir, significant savings would be realized by building the F–14 aircraft earlier because of a more efficient production rate and a shorter production

period resulting in less exposure to economic escalation. Our current estimates indicate that procurement of 100 F–14 aircraft delivered over a 24 month period versus delivery over a 38 month period would result in flyaway unit savings of approximately $600 K/aircraft or total savings of about $60 million.

Question. Would not a higher production rate result in lowering the procurement unit cost?

Answer. Yes, sir, a higher production rate significantly impacts manufacturing manhour requirements, labor and overhead rates and subcontract procurement costs and would therefore lower the procurement unit cost.

Question. Admiral, who will bear the cost of the engine modification resulting from the two aircraft crashes?

Answer. The cost of those engine modifications determined to be design improvement and clearly not the responsibility of the engine manufacturer will be borne by the Government. The cost of those engine modifications which are not design improvement and which are determined to be the responsibility of the engine manufacturer under the terms of the engine contract will be borne by the manufacturer.

Question. What do you estimate these costs to be?

Answer. Preliminary estimates disclose that near-term costs associated with the engine problem will approximate $13 million. Long term expenses, if any, will depend on the findings of the ongoing engineering investigation.

Question. Admiral, what sort of mix will you put on the carriers between the F–14 and the Air Combat fighter?

Answer. This has not been determined exactly. In the longer range, if the NACF incorporates the capabilities we expect to have in it, all Navy tactical missions should be conducted by either the F–14 or the NACF.

Question. Admiral, explain for the record why the Air Combat Fighter is seen as a replacement for the A–7.

Answer. Senator Thurmond, we greatly need to simplify the aircraft inventory aboard our carriers by reducing the numbers of basic airplane types, thereby reducing the support and training necessary for maintaining an effective force. Technology now permits multi-mission aircraft to be effective for both fighter and attack missions. As the A–7s become overaged in our inventory about the mid-1980's, we anticipate that the NACF will provide an effective replacement.

Question. In meeting the air-to-ground requirement, in what ways will the Air Combat Fighter fall short of the A–7?

Answer. In all areas other than maximum load capacity and extended range we would expect the attack variants of the Navy ACF to be equal to the A–7 plus having greater survivability in combat.

PREPARED QUESTIONS FROM SENATOR GOLDWATER

[Questions submitted by Senator Goldwater. Answers supplied by Department of the Navy.]

Question. Is the conversion in lieu of production, CILOP, program exclusive to Navy and Marine Corps?

Answer. Yes. The Navy and Marine Corps started the CILOP program in order to maintain force levels when approved procurement programs would no longer do this. Clearly it would be better to have advanced new technology fighter and attack aircraft in sufficient quantities, but with this not possible because of funding constraints, selective conversions of older aircraft to extend their useful service life is necessary.

Question. What is the latest program unit price for the F–14?

Answer. The latest F–14 program unit price, based on a 390 aircraft through FY 1980 is 18.8 million. As you know, this price includes flyaway, support, spares RDT&E and military construction costs.

Question. How much of the program unit price is attributable to the Phoenix system?

Answer. The Phoenix Weapon System is funded separately, from the Weapons Procurement, Navy appropriation. The current Phoenix program unit price, based on a total program of 2,532 missiles through FY1979 is .464 million.

Question. What is the annual Phoenix production? How many training missiles are fired each year?

Answer. Annual Phoenix production is planned at 340 missiles a year from FY1975 through FY1979. Approximately ten missiles are expended yearly for training.

Question. The FY '75 contract price of $348.3 million works out at about $7.0 million per aircraft. Please explain how the remainder of the costs for the F–14 are derived.

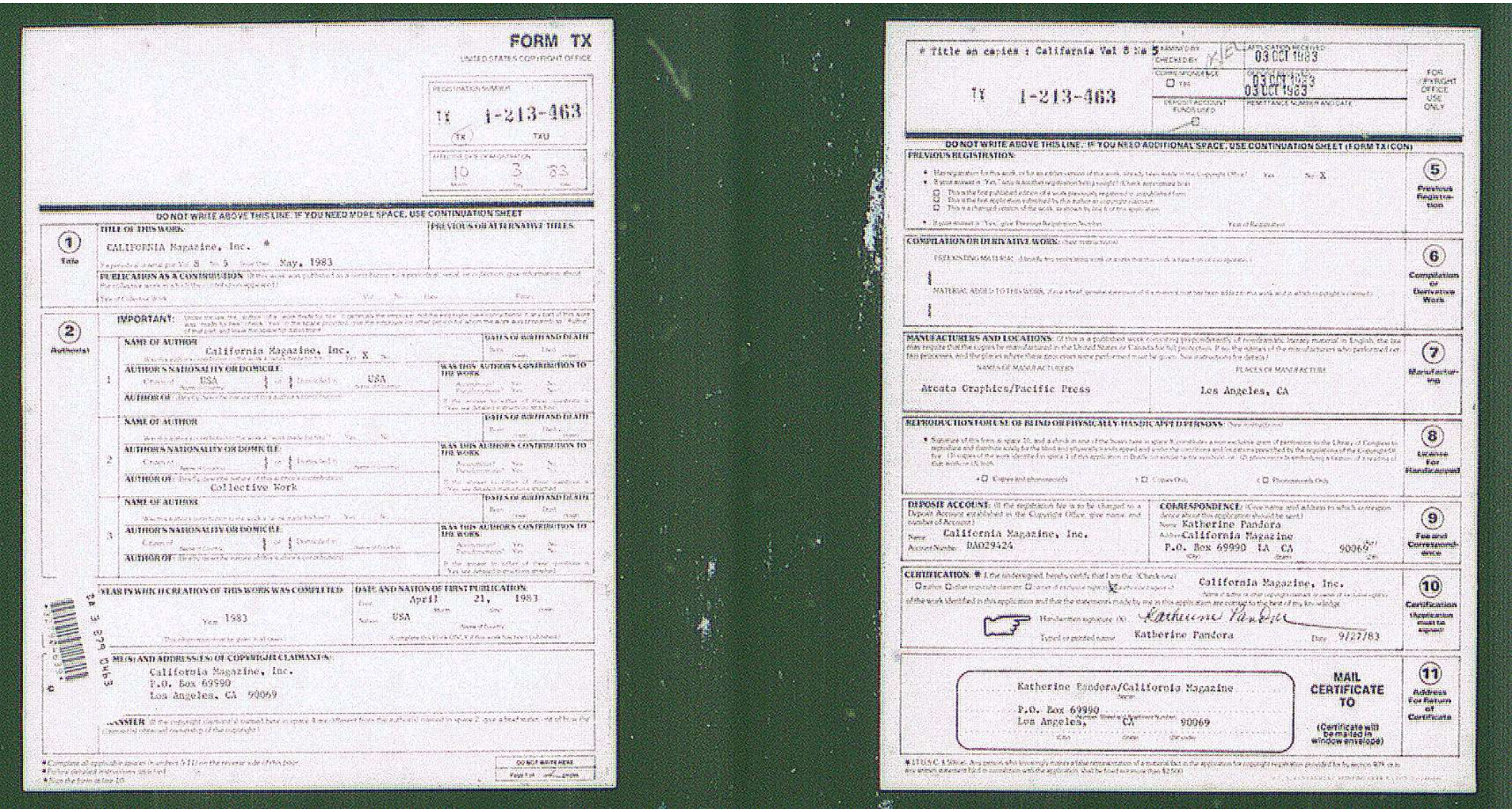
Answer. Seven million is the unit cost for the basic airframe. In addition, on a unit cost basis, we are spending .2 million for changes, 2.0 million for engines and accessories, 1.9 million for electronics, which includes the AWG–9 weapons control system, and .2 million for armament, other Government Furnished Equipment and non-recurring costs. This totals to a unit flyaway cost of 11.3 million. Support and spares, which are not budgeted on a unit basis, are 107.1 million and 34.2 million respectively.

Mr. CROMWELL. Thank you, gentlemen.

The committee will stand in recess until 2 o'clock.

(Whereupon, at 12:45 p.m., the committee recessed, to reconvene at 2 p.m. of the same day.)

Exhibit F



FORM TX

UNITED STATES COPYRIGHT OFFICE

REGISTRATION NUMBER

TX 1-213-463

TX TXU

EFFECTIVE DATE OF REGISTRATION

10 3 83

DO NOT WRITE ABOVE THIS LINE. IF YOU NEED MORE SPACE, USE CONTINUATION SHEET

1 Title

TITLE OF THIS WORK: CALIFORNIA Magazine, Inc. *

PREVIOUS OR ALTERNATIVE TITLES

PUBLICATION AS A CONTRIBUTION

2 Author(s)

IMPORTANT:

NAME OF AUTHOR: California Magazine, Inc.

DATES OF BIRTH AND DEATH

1 AUTHOR'S NATIONALITY OR DOMICILE: Citizen of USA Domiciled in USA

WAS THIS AUTHOR'S CONTRIBUTION TO THE WORK

AUTHOR OF:

2 NAME OF AUTHOR

AUTHOR'S NATIONALITY OR DOMICILE

AUTHOR OF: Collective Work

3 NAME OF AUTHOR

AUTHOR'S NATIONALITY OR DOMICILE

AUTHOR OF:

YEAR IN WHICH CREATION OF THIS WORK WAS COMPLETED: Year 1983

DATE AND NATION OF FIRST PUBLICATION: April 21, 1983 USA

3 NAME(S) AND ADDRESS(ES) OF COPYRIGHT CLAIMANT(S):

California Magazine, Inc.
P.O. Box 69990
Los Angeles, CA 90069

TRANSFER

DO NOT WRITE HERE

* Complete all applicable spaces (numbers 5-11) on the reverse side of this page.
* See detailed instructions attached.
* Sign the form at line 10.

* Title on copies : California Vol 8 No 5

PASSED BY / CHECKED BY

APPLICATION RECEIVED 03 OCT 1983

CORRESPONDENCE Yes

ONE DEPOSIT RECEIVED 03 OCT 1983

TWO DEPOSITS RECEIVED 03 OCT 1983

DEPOSIT ACCOUNT FUNDS USED

REMITTANCE NUMBER AND DATE

FOR COPYRIGHT OFFICE USE ONLY

TX 1-213-463

DO NOT WRITE ABOVE THIS LINE. IF YOU NEED ADDITIONAL SPACE, USE CONTINUATION SHEET (FORM TX/CON)

5 Previous Registration

PREVIOUS REGISTRATION

* Has registration for this work, or for an earlier version of this work, already been made in the Copyright Office? Yes No X

* If your answer is "Yes," is another registration being sought? (Check appropriate box)

☐ This is the first published edition of a work previously registered in unpublished form.
☐ This is the first application submitted by this author as copyright claimant.
☐ This is a changed version of the work, as shown by space 6 of this application.

* If your answer is "Yes," give Previous Registration Number: Year of Registration:

6 Compilation or Derivative Work

COMPILATION OR DERIVATIVE WORK: (See instructions)

PRECEDING MATERIAL: Identify any preexisting work or works that this work is based on or incorporates.

MATERIAL ADDED TO THIS WORK: Give a brief, general statement of the material that has been added to this work and in which copyright is claimed.

7 Manufacturing

MANUFACTURERS AND LOCATIONS: If this is a published work consisting preponderantly of nondramatic literary material in English, the law may require that the copies be manufactured in the United States or Canada for full protection. If so, the names of the manufacturers who performed certain processes, and the places where these processes were performed must be given. See instructions for details.

NAMES OF MANUFACTURERS: Arcata Graphics/Pacific Press

PLACES OF MANUFACTURE: Los Angeles, CA

8 License For Handicapped

REPRODUCTION FOR USE OF BLIND OR PHYSICALLY HANDICAPPED PERSONS: (See instructions)

* Signature of this form at space 10, and a check in one of the boxes here in space 8, constitutes a nonexclusive grant of permission to the Library of Congress to reproduce and distribute solely for the blind and physically handicapped and under the conditions and limitations prescribed by the regulations of the Copyright Office: (1) copies of the work identified in space 1 of this application in Braille (or similar tactile symbols); or (2) phonorecords embodying a fixation of a reading of that work; or (3) both.

☐ a. Braille and phonorecords ☐ b. Braille Only ☐ c. Phonorecords Only

9 Fee and Correspondence

DEPOSIT ACCOUNT: If the registration fee is to be charged to a Deposit Account established in the Copyright Office, give name and number of Account.
Name: California Magazine, Inc.
Account Number: DA029424

CORRESPONDENCE: (Give name and address to which correspondence about this application should be sent.)
Name: Katherine Pandora
Address: California Magazine
P.O. Box 69990 LA CA 90069
(City) (State) (ZIP)

10 Certification (Application must be signed)

CERTIFICATION: * I, the undersigned, hereby certify that I am the: (Check one)
☐ author ☐ other copyright claimant ☒ owner of exclusive right(s) ☐ authorized agent of California Magazine, Inc.
(Name of author or other copyright claimant, or owner of exclusive right(s))
of the work identified in this application and that the statements made by me in this application are correct to the best of my knowledge.

Handwritten signature (X): Katherine Pandora

Typed or printed name: Katherine Pandora Date: 9/27/83

11 Address For Return of Certificate

Katherine Pandora/California Magazine
(Name)
P.O. Box 69990
Los Angeles, CA 90069
(City) (State) (ZIP)

MAIL CERTIFICATE TO
(Certificate will be mailed in window envelope)

* 17 U.S.C. § 506(e): Any person who knowingly makes a false representation of a material fact in the application for copyright registration provided for by section 409, or in any written statement filed in connection with the application, shall be fined not more than $2,500.

Exhibit G

Chart of Similarities

Row	Story	2022 Sequel
1	Story singles out and focuses on two jocular, up-and-coming lieutenants competing to make names for themselves at the "Top Gun" aerial combat school who became close friends and a team, sharing the cockpit of state-of-the-art fighter jet: Alex a.k.a. "Yogi" a hotshot pilot and Dave a.k.a. "Possum," his radar intercept officer ("RIO").	1986 Film[1] focused on two jocular, up-and-coming lieutenants competing to make names for themselves at the "Top Gun" aerial combat school who became close friends and a team, sharing the cockpit of state-of-the-art fighter jet: Pete a.k.a. "Maverick" a hotshot pilot and Nick a.k.a. "Goose," his RIO, who dies in a flying accident. 2022 Sequel features hotshot pilot, Maverick, now older, and a key story element is his friendship with Goose, depicted in flashbacks and photos. Goose's legacy is also brought back in the form of his son, "Rooster," a Top Gun graduate.
2	Yogi (age 26) is single and is described as having dark hair and movie star good looks. Possum (age 25) is "married [to] his high school sweetheart," Lisa, and is described as having wavy light brown hair and a mustache.	In 1986 Film, Maverick is single, mid-twenties, good-looking (Tom Cruise), and Goose is married, with wavy light brown hair and a mustache. 2022 Sequel revolves around Maverick's memories and guilt re: Goose, Goose's wife, and their son, Rooster (wavy light-brown hair and a mustache).
3	Yogi and Possum are portrayed as close "family": Possum "will spend more hours of [his] married years with Yogi that with [his wife]."	Maverick and Goose are portrayed as close "family" in the 1986 Film and 2022 Sequel, and Maverick treats Rooster like a son.
4	Yogi wanted to fly since he was a young boy.	Maverick and Rooster wanted to fly since they were young.
5	Portrays Yogi as being enamored with high-intensity flying of the fastest fighter jets. He "wanted to fly ever since he was twelve." It "blew his mind," "but there	Maverick is enamored with high-intensity flying of the fastest fighter jets. Flying is all he ever wanted to do. He strived to be and was at the top of his class. 1986 Film portrays him this way and

[1] The 1986 Film is referenced with the 2022 Sequel when this provides context for understanding the similarity in the 2022 Sequel. Otherwise, if not separately delineated, the similarities below refer to the 2022 Sequel.

Row	Story	2022 Sequel
	was [an] admission price to the land of the giants." To fly the best fighter jets, he had to be the best.	2022 Sequel has him continually striving to be the very best of the best.
6	"Yogi was still in junior high school when he realized that flying straight and level might be okay for some people, but if you like yanking and banking—the feeling of riding inside one of those storm-in-a-bottle souvenirs—then there's just one place for you, and that's the cockpit of a fighter plane."	It is clear in the 1986 Film and 2022 Sequel that the only place where Maverick is truly at home is inside the cockpit of a fighter jet. In the 2022 Sequel, when he may have to give up flying fighter jets, it is like his whole world is being taken away and he can hardly fathom life without it.
7	Yogi is portrayed as being seriously focused and dedicated to continually improving his fighter-jet flying, combat, and tactical skills.	Maverick is seriously focused on cutting-edge flying and tactical skills in both the 1986 Film and 2022 Sequel and continuously pushes his own (and the Navy's) limits (e.g., forcing newest hypersonic plane to speeds exceeding Mach 10).
8	"Just getting to [Top Gun] was the ultimate break. Only the best young flyers in a squadron ever make it, and they have already raced past most fighter pilots their age. If they play it right and look sharp, they might even get invited back as Top Gun instructors -- which is as high as a fighter pilot can get."	In 2022 Sequel, Maverick, now legendary, is invited back to Top Gun as an instructor to train the best-of-the-best fighter pilots.
9	"The first thing they see" when Yogi and Possum enter the Naval Air Station is a sign that says "WELCOME TO FIGHTERTOWN U.S.A."	When Maverick enters the Top Gun Naval Air Station, on-screen title card says "WELCOME TO FIGHTERTOWN U.S.A."
10	The Naval Air Station, despite its supersonic, high-tech jets and rigorous training exercises, is romanticized and is portrayed as evoking 1950s post-war nostalgia: "Like the notion of the single-combat warrior, there is something slightly nostalgic about Naval Air Station Miramar. At night the darkened base could be mistaken	Despite its hypersonic, high-tech jets, and rigorous training exercises, the Naval Air Station is endearingly depicted with "1950s post-war nostalgia" and romanticized, as if from a bygone era. *See e.g.*, https://whstheshield.com/2020/12/08/topgun-propaganda/ (1986 Film); https://www.fox4news.com/news/top-

Row	Story	2022 Sequel
	for an old From Here to Eternity set, and even earlier in the day, when the base is bustling, it is enveloped in a time warp of unreality."	gun-maverickreview-top-gun-2-tom-cruise-miles-teller (2022 Sequel).
11	The Story is set at the "Top Gun" school at the Naval Air Station in Miramar, CA, which is close to the Pacific Ocean and beach.	The setting of the 2022 Sequel, which takes place in the present, is nonetheless a Top Gun school at a Naval Air Station near the ocean and beach, even though the *actual* "Top Gun" school moved in 1996 from Miramar, CA to land-locked Fallon, NV.
12	Yogi and Possum form a crew and, after their training, join other crews to form a battle-ready fighter squadron, the "Wolfpack." "For as long as they remain in battle the Wolfpack will be their home and family, security blanket and confessional circle."	In 1986 Film, Maverick and Goose form a crew and, after their training join other top crews, to form a fighter squadron. In the 2022 Sequel, Maverick instructs top crews comprising a fighter squadron in preparation for battle, which he leads. The squadron is portrayed as a close-knit family, personally involved with, and reliant on, one another.
13	Emphasizes playful nicknames of lead characters, "Yogi" and "Possum," and others (e.g., "Heater," "Tiger One," "Ratchet").	Emphasizes playful nicknames of lead characters, "Maverick," "Rooster" ("Goose's" son) and of others, whose nicknames are sources of comedic relief (e.g., "Baby on Board 'Bob,'" "Hangman").
14	Themes of jocular true grit, patriotic American nostalgia, the difficulty in balancing duty, love, and family, intergenerational divides, man versus machine, and the freedom that can only be found in the skies pervade the Story.	Themes of jocular true grit, patriotic American nostalgia, the difficulty in balancing duty, love, and family, intergenerational divides, man versus machine, and the freedom that can only be found in the skies pervade the 1986 Film and 2022 Sequel.
15	Characterizes fighter pilots as elite "hotshots" who are macho and cool. "Top Gun's hotshot aces have virtually revolutionized the fighter pilot business and . .	Characterizes fighter pilots as elite "hotshots" who are macho and cool. To form an elite squadron, the Navy assembles the No. 1 Top Gun graduates in each class who have established themselves as the masters of the deadly art of air-to-air combat.

Row	Story	2022 Sequel
	. established themselves as the international masters of the deadly art of air-to-air combat."	
16	Features Top Gun graduate, Randy Cunningham, as legendary because he not only downed "three MiGs [Russian fighter jets] in one day, but because those three took them over the magic five-kill line to make him the first official ace."	Maverick is legendary for being the only pilot to shoot down three MiGs in one day, shown in the 1986 Film, and touted in the 2022 Sequel, where, after Maverick shoots down two more enemy jets, it is touted that this takes him over the five-kill line to make him the first official Top Gun "ace."
17	Emphasizes those fighter jet instructors who "could speak with the authority of actual combat experience."	Maverick's extreme combat experience is compared to the elite pilots' lack of actual combat experience.
18	"At Top Gun, back in those postwar days, everybody was hot. So hot that the place sizzled even when nothing was happening. So hot that a lot of people suggested that even Randy Cunningham didn't truly belong there. Not that he wasn't a great fighter pilot. His three-MiG day was awesome."	When Maverick first shows up at the Naval Air Station, the Admiral in command conveys that he is a thing of the past, a dinosaur. And despite Maverick's legendary status and three-MiG day, the new elite fighter jocks refer to him as "Pops" or "Old Man."
19	Portrays an aviation "caste system" with "dividing lines drawn like the circles around the bull's eye." On the outside, bomber pilots, next attack pilots who charge at ground targets. "In the inner rings, where fighter pilots belong, there are finer distinctions that only the pilots themselves can discern, until one tiny circle is left at the center, the bull's-eye, where the elite of the fighter elite stand in glorious isolation. The greatest of the greats, the makers of legends—the 'shit-hots.'" The bull's-eye was chosen as a metaphor for a fighter pilot's ability. The closer to the bull's-eye, the greater the ability of the pilot.	To form a squadron for a special mission, the top Top Gun graduates gather for training by Maverick, a fighter-pilot referred to as "legendary." It is repeatedly emphasized that they are the fighter elites, the best of the best, they are hotshots. When Maverick first encounters the cockiest of them all, Hangman, he is throwing darts, consistently landing three-out-of-three *in the bull's-eye*. This is used as a metaphor to illustrate that he is the elite fighter pilot with the greatest ability.

Row	Story	2022 Sequel
20	"[T]his fighter pilot's Valhalla almost came to an end in late 1977, when a new Admiral assumed command of the Naval Air Station and set out to restore discipline and naval decorum . . . Suddenly the old peacetime regulations were being enforced, and before long the hotshots began to leave."	Instead of hailing Maverick as a hero, the Admiral at Top Gun makes clear that irreverent hotshots like Maverick have no place in his Navy, and the Vice Admiral under him values rules and regulations above the need of a top fighter pilot like Maverick to adapt quickly and instinctually to win.
21	Notes that the Top Gun's dark ages lasted until the rigid Admiral was replaced by another who "was a fighter pilot's pilot . . . A sigh of relief swept the fighter jock community, but by then so many of the original hotshots had left that hardly anybody with any war experience was available for a Top Gun instruction post."	Despite the disdain of the rigid Admiral, Maverick is asked to report to Top Gun to fill an instructor post to train the elite squadron because another Admiral (Iceman in the 1986 Film), a fighter pilot's pilot, who flew combat missions with Maverick, recognizes his value and war experience.
22	Characterizes Top Gun as a critical component of American national security. "IF WAR BROKE OUT AND THIS country's aviators were ready for it, it would be a first, and the credit would belong entirely to Top Gun."	Portrays Top Gun fighters as the only ones who can accomplish a seemingly impossible mission in enemy territory, vital to American national security.
23	Portrays Top Gun command as being fussy, finicky, and fawning over the pilots. "Fightertown . . . the entire mission . . . is to primp and fuss . . .[over] fighter jocks so that when the time comes and they're staring down the missile racks of [enemy jets], they are primed and ready."	The Top Gun command primps and fusses over these best-of-the-best fighter jocks and their training so they are primed and ready for a difficult mission in enemy territory.
24	Top Gun fighter pilots are portrayed romantically and metaphorically as elite knights, with a special code of honor, jousting in shining armor. For example: "If Miramar is a fighter pilot's Camelot, then [] Top Gun .	The greatest fighter pilots are assembled and, along with Maverick, their legendary leader, are portrayed romantically as

Row	Story	2022 Sequel
	. . is King Arthur's Round Table, the gathering of the greatest of the greats in fighter aviation."	crusaders—members of an elite order, with a special code of honor.
25	Aerial combat training is portrayed as very competitive and Yogi, as extremely competitive: "In this business you hate to lose . . . and getting shot is synonymous with losing."	Aerial combat training is portrayed as very competitive and Maverick, as extremely competitive, even as he returns to Top Gun as a much older instructor.
26	Fighter crews are crestfallen when they are outmaneuvered and "shot down" even though it is just a part of their training.	Fighter crews are completely crestfallen when they are outmaneuvered and "shot down" even though it is just a part of their training.
27	Sequences failed aerial combat maneuvers immediately followed by quiet, serious tactical discussions between fighters in the briefing room.	Failed aerial combat maneuvers by the elite fighters are followed by debriefing and tactical analysis in the classroom.
28	Colorfully characterizes and portrayals of dry mechanical details of a fighter jet: Emphasizes the afterburner in top fighter jets, an engine component that, at the pull of a throttle, burns huge amounts of fuel at incredible speed, resulting in a burst of raw power that no ordinary jet engine can duplicate and only a fighter needs; "Suddenly the acquisition symbol disappears, and a numbered aiming circle appears around the black square—this tells you at a glance how fast, how high, and in what direction the bogey is going . . . Pull the stick's missile release or gun trigger with your right index finger. Bingo.";"	Repeated dramatic shots of pilots pulling the throttle of their top fighter jets causing a huge burst of raw engine power, and compelling closeups of the pilots activating mechanical components, such as the triggering of the aiming circle that tracks the "enemy" jet's movements, index fingers on gun triggers, and the pushing the air-to-air weapon select button which lights up the system with a digital display.

Row	Story	2022 Sequel
	"Say you're entering bogey [enemy] country. To find out what's ahead, push the air-to-air weapon select button with your right thumb. (This is basically an 'on' switch-your head-up display and digital display indicators are now operating.)"	
29	Flying is depicted with weightless fluidity: "they're floating in their glass bubble through a . . . blue on blue crystal morning . . . Yogi whips the stick . . . from side to side and the plane rolls this way and that, letting him and Possum spot anybody making for their tail. From where they sit, however, it's not their silver rocket that's rocking but the entire vast blue dome of sea and sky. There are no ups or downs up here, no rights or lefts, just a barely perceptible line separating one blue from another, and that line is spinning and racing like mad in the distance."	Flying is depicted with weightless fluidity in a vast blue expanse, with little distinction between up or down, left and right, as glistening silver fighter jets angle, roll, and rocket through the sky.
30	Portrayal of aerial combat training as edgy and intense, and builds dramatic tension by emphasizing that the slightest mistake can be deadly and cost lives. "You wish you could do it over again . . . but in the real world you're not going to get a second chance."	Portrayal of aerial combat training as edgy and intense, and emphasized that the slightest mistake can be deadly and cost lives. Similar statements by Maverick and other pilots.
31	Creates suspense by characterizing aerial combat training as rigorous, and of life-or-death importance. "'You fight like you train, so you'd better train like you're going to fight,' fighter pilots like to say."	Portrays aerial combat training as rigorous, and of life-or-death importance. Similar statements by elite fighter pilots in the 2022 Sequel.
32	Fighter-jet crews exhibit a machismo attitude in challenging each other (e.g., "moving up to the F-14	Fighter-jet crews exhibit a machismo attitude in in challenging each other in the sky and back at the base.

Row	Story	2022 Sequel
	Tomcat meant crossing the magic line that separates the men from the boys").	
33	Fierce training "dog fights" are juxtaposed against a collegiate and convivial team spirit.	Training "dog fights" are portrayed as fierce, all while maintaining a collegiate team spirit.
34	Aerial combat training is portrayed by juxtaposing the ethereal beauty of the skies (the "vast blue dome of sea and sky") with jarring unpredictable action at gut-wrenching speeds.	Aerial combat training is portrayed by juxtaposing the ethereal beauty of the skies (the "vast blue dome of sea and sky") with jarring unpredictable action at gut-wrenching speeds.
35	Repeated references to pulling too many Gs (e.g., "When you are pulling Gs—withstanding several times the force of the earth's gravitational pull—the pressure comes from everywhere. Even your eyelids weigh several times what they normally do, and the pressure on your chest is so intense that you can hardly breathe.").	Repeated references to and visuals of the fighter pilots and their WSO (the pilot in the rear of the cockpit) feeling the intense physical torture of pulling Gs, with particular focus on their strained faces under pressure.
36	Portrays the danger of flying by inviting the reader to imagine pulling too many Gs, blacking out, and flying a jet at supersonic speeds while unconscious.	One of the fighter pilots blacks out after pulling too many Gs in repeated maneuvers, and narrowly escapes death when his jet plummets toward the ground.
37	A running theme that the sheer intensity of flying top fighter jets, "strapping on 25 tons of airplane," and pulling tortuous Gs at supersonic speeds is what adrenaline-junky top fighter pilots love and live for.	A running theme that the sheer intensity of flying huge high-tech fighter jets, and pulling tortuous Gs at supersonic speeds is what adrenaline-junky top fighter pilots love and live for, particularly Maverick, who in a major scene pushes himself and his plane past a record-breaking Mach 10.
38	"So, that's where it all starts. With the love of flying." Characterizes the love of flying as all-consuming, and	The 2022 Sequel repeatedly emphasizes the characters' love of flying, even at the expense of personal and familial relationships.

Row	Story	2022 Sequel
	as coming at the expense of personal and familial relationships.	
39	"Taking off and flying through those fluffy white clumps was a near-sexual delight. It didn't last. As we . . . began dogfighting with Yogi and Possum . . . [this] was brutally shattered . . . as Yogi and Possum drifted away, vanished, then turned and headed back in our direction. Suddenly Shoes whipped the stick hard . . . and before I could catch my breath or brace myself . . . he pushed the throttle and sent us into a sharp climb."	Scenes with crews cruising in the serene sky until suddenly their tranquility is shattered by a fighter jet *heading right toward them* causing them to breathlessly ascend in a fast, sharp climb.
40	"Shoes suddenly pointed the plane nose down and went into a dive. I couldn't keep track of Yogi and Possum's plane, streaking by like flashes of metallic light and nothing more."	Depicts fighter pilots unexpectedly turning their planes nose down in a steep dive, while dueling planes streak by like flashes of metallic light.
41	As plane dives, "I had never, felt so useless in all my life. I had lost control of everything that was happening from one second to the next, exactly the opposite of what fighter pilots feel—and must feel—all of the time."	Maverick demonstrates and teaches the other fighter pilots that, to succeed in their mission, their focus and control must be total and they must react instantaneously and instinctually, with no time to think.
42	"There was more flying than they had ever had . . .one-versus-one hops (one student crew against one instructor) . . . then the tough two-versus-unknown hop, in which two crews take off not knowing . . .where the bogey [instructor "enemy" plane] will] come from . . . when the bogey rolls in and sends them home with a simulated [] shot. Before long the hops were running into each other, and Yogi and Possum noticed that something was happening to them. They were flying	The elite squadron engages in more rigorous back-to-back combat training than ever before. Maverick (as the instructor "enemy") takes on single crews one-on-one; then two crews are flying when Maverick rolls in behind them from nowhere, sending them home with a simulated shot. This edge-of-the-seat, hard, intense, mind-bending flying continues as the squadron is being hammered into an elite team.

Row	Story	2022 Sequel
	twice a day . . . edge-of-the-seat, hard flying, intense, mind-bending flying . . . They were being hammered into a team."	
43	"Yogi and Possum were zipping along, shooting up mountains and down canyons and flying so low that it was hard to keep from staring at the ground, but they had to keep looking for bogeys."	The mission requires the elite squadron to train and fly fast and extremely low to the ground through canyons and then to quickly shoot up mountains.
44	"Yogi found out that his bogey had just fired a missile . . . with a heatseeking missile heading his way" he "break[s] hard–pull[s] away fast–to foul up the missile's tracking system . . . and head[s] up in a 7.5-G climb."	When Maverick finds out that an enemy plane has just fired a heat-seeking missile which is heading his way, he brakes hard and pulls away fast to foul up the missile's tracking system and heads up in a high-G climb.
45	Points out that at high angles of flight, not enough air flows into the engines of the top fighter jets, and they can die.	In the 1986 Film, Goose dies after the fighter jet engine flames out as a result of poor air flow resulting in a fatal flat spin. Goose's death plays a prominent role in the 2022 Sequel which also features scenes where engines die in the middle of flight maneuvers.
46	Points out that when faced with deadly accidents of others in training, fighter pilots have an incredible denial mechanism, and just keep flying: "That none of these accidents dampened the pilots' enthusiasm for the plane is just another clue to the fighter pilot's code . . . Planes take off and land every day without accidents, so obviously it can be done."	After Goose's tragic death in the 1986 Film (the 2022 Sequel's backstory) Maverick and the others carry on flying. In the 2022 Sequel, despite a near-deadly accident in training, the fighter pilots also exhibit this incredible denial mechanism, and just keep flying. In training the elite squadron, Maverick discusses the dangers of the planned mission but insists, in the face of skepticism regarding dangerous maneuvers, and then demonstrates, it can be done.
47	Emphasizes that "accident reports that clearly demonstrate technical failures don't erase the [fighter pilot's] lingering doubt" that there must have been	After Goose dies in a flying accident with Maverick at the helm, Maverick, though cleared of blame in the accident report, cannot forgive himself and believes there must have been something he

Row	Story	2022 Sequel
	something he could have done but did not. Characterizes pilots as going out of their way to take responsibility for what happens in the air, regardless of what "reports" might say.	could have done to avoid it. This pervades the 1986 Film and the 2022 Sequel in Maverick's flashbacks and interactions with Goose's son.
48	Crews in training are under intense time pressure and are set back if they botch training exercises. Yogi and Possum train against a ticking clock, "And now they [Yogi and Possum] have only three weeks left to make it up."	Maverick and his elite squadron train under a ticking clock as they have only three weeks to be mission-ready. They are under intense time pressure and suffer setbacks when training exercises are botched.
49	Raises the dramatic stakes of flying errors by emphasizing the huge price tag of each fighter jet and the cost/difficulty of obtaining parts: "the biggest problem, however, is the F-14's price."	Vice Admiral refers to huge, multimillion-dollar cost of a top fighter jet that crashed during training, at government expense.
50	Running theme that, with all the high-tech machinery, it still comes down to people—to a handful of courageous elite fighter-jet crews. "This is the anachronism of fighter aviation. Even in this age of remote-control, pushbutton warfare, the survival and effectiveness of the entire U.S. Pacific Fleet rests on a few dozen young men getting themselves catapulted off a flight deck and hanging it in the skies against numerically superior, land-based enemy planes."	The Rear Admiral lectures Maverick that flyboys like him are obsolete, soon to be replaced by pushbutton drones. Maverick and the elite squadron he trained proves him wrong; that it all comes down to the skill and courage of people. Catapulted one-by-one into the sky off the flight deck of an aircraft carrier, they defeat superior land-based enemy missiles and numerically superior fighter jets against all odds. Maverick's arc shows that he still has a place in the Navy.
51	Notes some hotshot pilots are irreverent of Navy command, and play games in the air. For instance, as legend has it, "thumping," where "a guy might be lying straight and level without a care in the world when another would come slinking behind and below, then shoot under him and go into a sharp climb right in front	In both the 1986 Film and the 2022 Sequel, the irreverent Maverick pulls this exact same "thumping" stunt, unexpectedly scaring the living daylights out of other top fighter pilots.

Row	Story	2022 Sequel
	of his nose—not only scaring the living daylights out of him but interrupting the air currents around his wings."	
52	The hotshot fighter-jet crews, engaged in aerial showdowns, are portrayed as courageous cowboys (e.g., "At Mach 2 and 40,000 feet over California, it's always high noon."; "That's where fighter pilots such as Yogi and Possum figure in . . . to ride shotgun over the carrier's three squadrons of attack planes.").	Maverick and some of the hotshot fighter pilots he trains are portrayed as audacious cowboys with slick combat maneuvers who engage in aerial one-on-one duels/showdowns in a high-desert setting, evoking and enhancing the same "Western" analogy.
53	Features a stunning air maneuver, the "vertical egg," in which two planes chase each other in ever-widening vertical loops.	In an exhilarating aerial combat training scene, two planes are engaged in this, chasing each other in ever-widening vertical loops.
54	Creates dramatic tension by emphasizing that there is no way to practice using a jet's ejection seat by pulling on its black and yellow striped bars. A pilot can only avoid death by remembering the steps. "*That's how the ejection seat is supposed to work if anything goes wrong with the plane, but the trouble is you can't practice with it, only memorize a series of steps*." (emphasis added).	Features Goose's son, Rooster, in an F-14 cockpit when the plane has been shot. Camera focuses on black and yellow striped bars. Rooster frantically pulls on the bars to eject, *but they just don't work*. And, in the 1986 Film, Goose dies when he ejects but hits his head on the F-14's canopy in the execution of the ejection steps.
55	Prominently features "a Blue Angel 'back-to-back'" stunt where a fighter pilot flies upside down close and parallel to another jet: "pilots demonstrate the agility and grace of their 25-ton monsters."	*Both* the 1986 Film and 2022 Sequel prominently features this daring, elegant stunt performed by Maverick.

Row	Story	2022 Sequel
56	Emphasized that the Wolfpack squadron leader does "200 push-ups . . . a day" in preparation for competitive aerial combat "joust[s]."	When the top pilots are competitively training against Maverick, they place a "bet" that whosever plane is "shot" has to do "200 push-ups," followed by Maverick's trainees repeatedly doing 200 pushups on the tarmac. Rooster proves his worth by completing his 200 push-ups, after his superior says he can stop.
57	"[Yogi] finished flight school at the top of his class[.]" "Yogi and Possum finished the Top Gun course . . . As their class picture went up in the briefing room . . . the news came that the Wolfpack was named top fighter squadron on the West Coast—one of only two contenders for the Admiral Clifton Award, the navy's greatest tribute to a fighter squadron."	In 1986 Film, Maverick finishes the Top Gun course at the top of his class, and this is mentioned as well in the 2022 Sequel. Further emphasized in 2022 Sequel that each of the members of the elite squadron being assembled for the mission graduated Top Gun at the top of their class.
58	Emphasizes wooden plaques and an inner room at Top Gun school "covered from floor to ceiling with heavily carved wooden plaques—[]like coats of arms—of the various squadrons."	Features an inner room at Top Gun covered from floor to ceiling with carved wooden plaques, focusing on the plaque for Maverick's graduating class, showing Maverick and Goose together and a plaque featuring Iceman (now an Admiral) as No. 1 in that class.
59	Intense training and flying is juxtaposed against frat-boy like R & R at a bar where the pilots drink beer and carouse. "It is the Wednesday night happy hour, and the small, noisy room is packed with pumped-up fighter jocks."	Frat-boy like R & R is featured, particularly at a crowded, noisy Top Gun bar where pumped-up fighter-jet jocks drink beer and carouse.
60	Portrays fighter pilot jocks as cocky and sometimes reckless. Stopped by police for speeding: "'It's all right, officer, we're from California,' a tanked-up marine hotshot once told a cop who had stopped him.	Maverick is portrayed as cocky in the face of authority figures and reckless at times. Hangman, like Maverick in his youth, is also cocky and sometimes reckless.

Row	Story	2022 Sequel
	'This is California,' the cop answered, and wrote him up."	
61	Portrays fighter pilots fraternizing as a way of bonding and blowing off steam. "They do it . . . for the same reason stunt men or [] cops or anybody else who hangs it out there for a living heads for a bar after a day's work. 'You're out there supersonic going from deck to 40,000 feet and back down to the deck, simulating killing people and getting yourself killed, handling actual emergencies, and when you finally come in and land you can't even tell your wife about it.'"	After grueling dangerous training sessions, the fighter pilots fraternize together, bonding at the bar, playing crazy football shirtless etc. Close bond between Maverick and Goose, which ended in Goose's death, is featured, while Maverick struggles to maintain distance from his love interest given the dangers of his profession.
62	Close camaraderie pervades the squadron, despite intense competition between the fighter jet crews. "The Wolfpack organized a bash . . . to give naval aviators back from a cruise a place to let off steam. Anything goes, including, after enough beer went down one evening, pushing all the tables together in the shape of a carrier deck, stretching a few towels across, and doing belly landings."	Close camaraderie pervades the squadron, despite intense competition between the fighter-jet crews. In one scene at their favorite bar, Goose's son, Rooster, unplugs the juke box and plays "Great Balls of Fire" as the others boisterously chime in. In another, the crews play a crazy game of shirtless tackle football where everyone plays both offense and defense.
63	The Wolfpack squadron presents "a good-size brass bell" to the bar. "It was no ordinary bell. The Wolfpack had brought it for a purpose, to help uphold the club's bylaws, which state that a bell should be rung on two occasions—when someone walks into the club with his hat on, or when a customer finds himself behind the bar. On either occasion, the transgressor picks up the tab for everybody's drinks."	Hanging behind the bar is a good-sized brass bell with a special purpose. As explained by the bar owner (Maverick's love interest), the bell is rung when someone breaks the house rules—no cell phones on the bar and don't disrespect a lady or the Navy. On either occasion, the transgressor (including Maverick) picks up the tab for everybody's drinks.

Row	Story	2022 Sequel
64	"There were the drinking sessions . . . But most of all there was flying. Glorious flying. The greatest fighter flying in the world was taking place every day . . . as Top Gun's [] vets set out to rewrite every single fighter aviation text ever written."	The 2022 Sequel is an homage to incredible flying which we witness in the crews' combat training sessions and their actual combat mission. Maverick literally throws out the aviation textbook and seeks to rewrite the Navy's aviation rules (e.g., how low to the ground the top fighter jets can fly or how many Gs a pilot can pull in a steep ascent) to achieve the impossible mission he and his squadron must fly.
65	As surprise R & R, the Wolfpack is presented with "a glorious sailing yacht" which they set out on.	Maverick is taken for a surprise ride on a beautiful sailing yacht by his love interest.
66	"[E]ven the greatest air battle is a series of individual duels—that, while a dozen pilots may blast off a carrier at one time, once they get up there they are alone, hurtling through enemy air at 750 miles an hour and tilting against tiny motes of silver that zoom out of the blue to become fire-spitting machines."	The squadron blasts off an aircraft carrier for their mission, but as they try to make their way back through enemy airspace, they are isolated when attacked by enemy planes and the combat scenes are just like this.
67	Describing true combat aerial "duels" "when one knight from each side would come out and they'd joust, one on a white horse and one on a black horse."	Light silver fighter jets in the squadron engage in one-on-one duels with black enemy planes.
68	Portrays a dangerous enemy encounter with playful cheekiness. "As they escorted the [Russian] plane away, Yogi edged up so close that he could look over and see the Russians in their cockpit, staring at him . . . He waved the way one does when someone is taking pictures, but the Russians didn't wave back—not even when Yogi's back-seater took their picture."	In the 1986 Film, Maverick flies close to and level with a Russian MiG, smiles, and takes a snapshot of the Russian pilot. In the 2022 Sequel, Maverick and his back-seater, Rooster, fly close to and level with an enemy plane that is trying to escort them away, Maverick smiles and waves, but the enemy pilot does not wave back.

Row	Story	2022 Sequel
69	Emphasizes that the F-14's "wings can sweep back for fast flying or open to the sides like an eagle's for landing or just for cruising around[.]"	In the 1986 Film (where they mostly fly F-14s) this is not highlighted. But tellingly in the 2022 Sequel, of all technical aspects, this one is selected as a plot point, as Maverick displays this F-14 feature by using it to enable a very short takeoff on a bombed-out runway.
70	Characterizes landing a fighter jet on an aircraft carrier in the middle of the ocean as a "controlled crash . . . if you are lucky."	In a major scene after their mission, Maverick completes the harrowing task of landing an F-14 jet on an aircraft carrier, with his wheels shot off.
71	A resounding affirmation of the dedication, focus, patriotism and true heroism of fighter pilots.	A resounding affirmation of the dedication, focus, patriotism and true heroism of fighter pilots.
72	"'Really great fighter pilots are like the great gunfighters in the Old West . . . They didn't have to tell anybody how great they were—all they had to do was just stand there, and the aura was such that everybody knew. It's the same here. Everybody knows.'"	Maverick, the most legendary Top Gun pilot, is portrayed like this throughout the movie. E.g., Cyclone remarks that Maverick's reputation as a great fighter pilot and troublemaker precedes him; Maverick sits relaxed at the bar while he causally looks on as the other hotshot pilots compete for status with bravado.
73	Settings and their sequencing: jumps between base scenes, classroom scenes, bar scenes, sailing scenes, mission scenes, and flashbacks, with intense flying scenes interspersed throughout.	Settings and their sequencing: jumps between base scenes, classroom scenes, bar scenes, sailing scenes, mission scenes, and flashbacks, with intense flying scenes interspersed throughout.
74	Story takes place on a naval base with weapons of war but focuses on the backstories, passions, and dreams of those who are stationed there.	Story takes place on a naval base with weapons of war but focuses on the backstories, passions, dreams, and past regrets of those who are training there.
75	Intergenerational tensions between the older experienced pilots (now instructors) and the younger	Intergenerational tensions between the older experienced Maverick (now an instructor) and the younger restless fighter pilots.

Row	Story	2022 Sequel
	generation of restless, ambitious up-and-coming fighter pilots.	
76	Recurring theme that success in warfare comes down to the pilot, his courage and strength of character, not the high-tech jet he's flying.	Recurring theme that success in warfare comes down to the pilot, his courage and strength of character, not the high-tech jet he's flying.

Exhibit H

Marc Toberoff (S.B. #188547)
mtoberoff@toberoffandassociates.com
Jaymie Parkkinen (S.B. # 318394)
jparkkinen@toberoffandassociates.com
TOBEROFF & ASSOCIATES, P.C.
23823 Malibu Road, Suite 50-363
Malibu, CA 90265
Telephone: (310) 246-3333
Facsimile: (310) 246-3101

Alex Kozinski (S.B. # 66473)
alex@kozinski.com
719 Yarmouth Rd, Suite 101
Palos Verdes Estates, CA 90274
Telephone: (310) 541-5885
Facsimile: (310) 265-4653

Attorneys for Plaintiffs

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

SHOSH YONAY, an individual, and YUVAL YONAY, an individual,

Plaintiffs,

v.

PARAMOUNT PICTURES CORPORATION, a Delaware corporation, and DOES 1-10,

Defendants.

Case No. 22-CV-03846-PA-GJS

FIRST AMENDED COMPLAINT FOR:

[1] BREACH OF CONTRACT
[2] DECLARATORY RELIEF
[23] COPYRIGHT INFRINGEMENT
~~**[3] INJUNCTIVE RELIEF**~~

DEMAND FOR JURY TRIAL

Plaintiffs Shosh Yonay and Yuval Yonay (collectively, the "Yonays" or "Plaintiffs"), the heirs of writer Ehud Yonay (the "Author"), for their complaint against defendant Paramount Pictures Corporation ("Paramount"), allege as follows:

NATURE OF THE ACTION

1. Ehud Yonay is the author of the original 1983 story entitled "Top Guns," (the "Story") from which the 1986 motion picture "Top Gun" (the "1986 Film") and the recently released 2022 sequel motion picture "Top Gun: Maverick" (the "2022 Sequel") are derived.

2. The iconic 1986 Film all started with Paramount securing exclusive motion picture rights to Ehud Yonay's copyrighted Story immediately after its publication. In fact, the Author's Story was duly credited on the derivative 1986 Film, which is widely known to have been based on the Story.

3. On January 23, 2018, the Yonays properly availed themselves of their right to recover the copyright to the Story under the Copyright Act, 17 U.S.C. § 203(a), by sending Paramount a statutory notice of termination (the "Termination Notice") and thereafter filing it with the Copyright Office, effective January 24, 2020.

4. On January 24, 2020, the copyright to the Story thus reverted to the Yonays under the Copyright Act, but Paramount deliberately ignored this, thumbing its nose at the statute. This case arises out of Paramount's conscious failure to re-acquire the requisite film and ancillary rights to the Yonays' copyrighted Story prior to the completion and release of their derivative 2022 Sequel.

5. Paramount engaged in the willful conduct alleged herein, notwithstanding that it is a sophisticated multinational corporation whose core business is based upon the value and enforcement of copyrights and other intellectual property.

PARTIES

6. Plaintiff Shosh Yonay is an individual and citizen of, and resides in, Israel. Shosh Yonay is the widow and heir of the Author.

7. Plaintiff Yuval Yonay is an individual and citizen of, and resides in, Israel. Yuval Yonay is the son and heir of the Author.

8. Upon information and belief, Defendant Paramount is a corporation organized and existing under the laws of the State of Delaware, which has its principal place of business in the County of Los Angeles, California.

JURISDICTION AND VENUE

9. This is a civil action for copyright infringement and injunctive relief under the United States Copyright Act, 17 U.S.C. §§ 101 *et seq*. (hereinafter, "the Copyright Act") ~~and~~ for declaratory relief under the Declaratory Judgment Act, 18 U.S.C. § 2201, and for breach of contract.

10. This Court has original subject matter jurisdiction over the claims set forth in this complaint pursuant to the Copyright Act, 17 U.S.C. § 101 *et seq*., 28 U.S.C. §§ 1331, 1332, and 1338(a), and the Declaratory Judgment Act, 28 U.S.C. § 2201, and supplemental subject matter jurisdiction over the state-law contract claims pursuant to 28 U.S.C. § 1367.

11. Upon information and belief, this Court has personal jurisdiction over Paramount because it has its principal place of business in the State of California and in this District, and because a substantial portion of the relevant acts complained of herein occurred in the State of California and in this District.

12. Upon information and belief, venue is proper in this Court pursuant to 28 U.S.C. § 1391(b)(1) because Paramount resides in this District, and pursuant to 28 U.S.C. § 1391(b)(2), because a substantial part of the events giving rise to this action occurred in this District.

STATUTORY BACKGROUND

13. The U.S. Copyright Act of 1976, 17 U.S.C. § 101 *et seq*. (the "Copyright Act"), provides an author with the inalienable right to recapture the copyright to the author's creative material, after a lengthy waiting period, by statutorily terminating without cause prior transfer(s) of such copyright. Termination is carried out by simply serving advance notice of termination on the original grantee or its successors and filing the notice with the U.S. Copyright Office, within delineated time windows. 17 U.S.C. § 203(a).

14. Section 203(a) provides for the termination of post-1977 transfers of rights under copyright by the author during a five (5) year period commencing thirty-five (35) years after the date the rights were transferred. *Id*. § 203(a)(3). The requisite notice of termination sets forth the

"effective date" of termination, within the five-year termination "window," when the previously transferred rights under copyright will be recaptured by the author. Notice of termination may be served by the author at any time between ten (10), and two (2) years before the effective termination date. *Id*. § 203(a)(4)(A).

15. "Works for hire" are the sole exemption from the Copyright Act's termination provisions. *Id*. § 203(a).

16. The termination right is the most important authorial right provided by the Copyright Act, short of copyright itself. Congress was therefore very protective of the termination right and, to that end, enacted a number of provisions to prevent any waiver or encumbrance of the termination interest. For instance, "[t]ermination of the [prior copyright] grant may be effected notwithstanding any agreement to the contrary[.]" *Id*. § 203(a)(5).

17. Furthermore, "[h]armless errors in a [termination] notice that do not materially affect the adequacy of the information required to serve the purposes of . . . section [203(a)] of title 17, U.S.C . . . . shall not render the notice invalid." 37 CFR § 201.10(e)(1).

18. Congress anticipated that an author's exercise of his/her termination right would usually result in a new license by the author to the terminated grantee(such as Paramount). To that end, Congress provided "the original grantee" with the exclusive opportunity to re-license an author's recaptured copyright "after the notice or termination has been served," but before "the effective date of the termination." *Id*. § 203(b)(4). The termination provisions thus reflect a deliberate balance of competing interests.

19. Under the termination provisions, prior derivative works can continue to be distributed just as before. 17 U.S.C. § 203(b)(1). Thus, the Yonays' recovery of the U.S. copyright to the Story does not prevent Paramount or its licensees from continuing to exploit prior derivative works, including the 1986 Film; it just requires a new license for sequel films and other derivative works completed after the January 24, 2020 termination date.

20. In addition, because the Copyright Act has no extraterritorial application, foreign rights to the Story remain with Paramount such that, notwithstanding the Yonays' Termination Notice, Paramount would always continue to benefit from "Top Gun." After the January 24, 2020

termination date, a new U.S. license from the Yonays to Paramount of the underlying Story would simply enable them to fairly participate with others in the proven market value and financial rewards of the Author's creation, just as Congress intended. H.R. Rep. No. 94-1476, at 124 (1976).

FACTS COMMON TO ALL CLAIMS FOR RELIEF

The Chain of Title

21. Ehud Yonay's Story was originally published on April 21, 1983 in the May 1983 issue of *California* magazine and was registered in the U.S. Copyright Office on October 3, 1983 (Reg. No. TX0001213463). *California* magazine featured best-selling novelists and screenwriters such as Tom Wolfe, Joan Didion and Joe Eszterhas. For the fifteen years it was published (1978-1991), *California* was as a purveyor of "New Journalism," which employs unconventional literary techniques and the subjective literary style of long-form non-fiction.

22. The magazine, with modest circulation, was not well known, and the subject of the Story—a naval training base—was ~~rather~~certainly dry. ~~In contrast, however,~~But the Author's copyrighted Story was written in a remarkably vivid and cinematic fashion, with references to Hollywood stars and epic films such as "From Here to Eternity." Rather than focusing ~~merely~~ on the ~~dry~~ historical details of the training school, the Story focuses on the pilots (the "Top Guns") and their personal experiences, singling out two in particular, a hotshot pilot ("Yogi") and his radio intercept officer ("Possum"), as they are hammered into a team. It skillfully selects accounts of the pilots' personal lives and ~~precise details of~~ their "hops" (flight maneuvers) to construct a romanticized, first-hand experience of what it is like to be a member of an elite Navy fighter squadron. Indeed, the literary and cinematic way the Story humanized and energized its subject was so compelling that Paramount immediately sought to lock up exclusive film rights from its Author. The resulting films, which faithfully translate ~~this~~the Author's vision and narrative to the screen, have given audiences worldwide a close-up look at the lives of U.S. Navy fighter pilots, as unconventionally curated by Ehud Yonay's ~~compelling~~dramatic Story.

23. Within weeks of the Story's publication, Paramount secured from Ehud Yonay an ~~exclusive~~ "Assignment of Rights" dated May 18, 1983, ~~of~~ locking up the *exclusive* motion picture,

television and ~~allied~~merchandising rights under copyright in the Story (the "~~Grant").~~1983 Agreement"). A copy of the 1983 Agreement is attached as Exhibit 2 to this complaint.

24. In the 1983 Agreement Paramount refers to the Story not as a news "article," but as a "published story written by Ehud Yonay entitled 'TOP GUNS'." It also repeatedly refers to and acknowledges the Author's "copyright" in the Story; and ensures that the Story is "wholly original with the Author." In the 1983 Agreement, Paramount further ensures that the Author will "extend . . . such copyright or copyrights" in his Story and "and will convey, grant and assign to [Paramount] such . . . extension of copyright and the rights herein conveyed, granted and assigned for such . . . extended term", and appoints Paramount "as the attorney-in-fact of the Author . . . to execute, deliver and record on behalf of the Author and in the name of the Author or otherwise, any and all assignments and other documents necessary or proper to convey, grant and assign to [Paramount] such . . . copyright and the rights herein conveyed, granted and assigned, for the term" thereof.

25. Paramount's 1983 Agreement thus ensured that no competing motion picture studio could produce a motion picture based on the Author's Story.

~~24~~26. There is also no doubt that the copyrighted Story was the clear genesis of Paramount's 1986 mega-hit film, "Top Gun." But for the Author's literary efforts and his Story's evocative prose and narrative, Paramount's beloved ~~film franchise~~1986 Film and its highly successful 2022 Sequel would not exist.

~~25~~27. On January 23, 2018, the Yonays properly availed themselves of their termination rights under the Copyright Act, 17 U.S.C. § 203(a), by sending Paramount a statutory notice of termination, terminating the ~~Grant of the~~ Author's grant in the 1983 Agreement of all rights under U.S. copyright in the Story, effective January 24, 2020.

~~26~~28. The Termination Notice, recorded with the U.S. Copyright Office on January 29, 2018 (Doc. No. V9949D433), fully complied with Section 203(a) of the Copyright Act and the regulations promulgated thereunder by the Register of Copyrights, 37 C.F.R. § 201.10.

~~27~~29. Therefore, as of January 24, 2020, the Yonays are the sole owners of the U.S. copyright in the Story.

The 2022 Sequel is Derived from the Story

~~28~~30. Ehud Yonay's Story told the story of the Navy Fighter Weapons School training program as personified by the Author through the eyes of two lieutenants in the course, a hotshot pilot ("Yogi") and his friend and second in the

~~29~~31. In the Story, the Author brought to life what could have easily been a barren subject of facts and figures by painting the Naval Air Station as a place of death-defying competition, comradery, romanticism, and 1950s post-war nostalgia. The Author's incredibly vivid imagery strapped readers in to the cockpit of a fighter jet long before the days of GoPro cameras and smartphones.

~~30~~32. In fact, Ehud Yonay's colorful telling of the Navy training program was so exhilarating and cinematic that it compelled Paramount to immediately seek him out and secure the exclusive rights under copyright to produce films based on his Story, mere weeks after its publication.

~~31~~33. The resulting 1986 Film, produced by Jerry Bruckheimer and its screenplay written by Jim Cash and Jack Epps, Jr., was clearly derived from the Story. ~~Indeed~~Accordingly, the 1986 Film specifically credits Ehud Yonay for his Story. ~~It~~Indeed, it is ~~also well~~widely accepted that "Top Gun" was based on the Story.

~~32~~34. The 2022 Sequel incorporates and adheres so closely to the 1986 Film that it is referred to in the entertainment industry as a "legacy sequel." It naturally follows that the 2022 Sequel ~~to the 1986 Film~~, again produced by Bruckheimer and on which Cash and Epps again received writing credit, is derived from ~~Ehud Yonay's~~the Story on which the 1986 Film is based.

~~33~~35. A review of the 2022 Sequel, like the 1986 Film, reveals key elements that are substantially similar to those in the Story, as set forth in Exhibit 1 to this complaint, and incorporated by reference herein.

Paramount's Exploitation of the 2022 Sequel Infringes the Story

~~34~~36. Despite the 2022 Sequel clearly having derived from the Story, Paramount ~~consciously failed~~did not bother to secure a new license of film and ancillary rights in the copyrighted Story following the Yonays' recovery of their U.S. copyright on January 24, 2020.

~~35~~37. Plaintiffs are informed and believe and based thereon allege that the 2022 Sequel was not completed until May 8, 2021, more than one year *after* Paramount's ~~Grant~~grant in the 1983 Agreement had been statutorily terminated. The 2022 Sequel therefore, unlike the 1986 Film, does not qualify for the "prior derivative works exception" to statutory termination, 17 U.S.C. § 203(b)(1), and thus infringes the copyright owned by the Yonays.

~~36~~38. Plaintiffs are informed and believe and based thereon allege that Paramount was and is involved in the financing, production, and distribution of the 2022 Sequel in the United States and is the film's purported copyright holder.

~~37~~39. Without a newly secured license, Paramount's exploitation of the 2022 Sequel in the United States constitutes ongoing intentional infringement of the Yonays' copyright, including without limitation, their exclusive right to "prepare derivative works based upon the copyrighted [W]ork," 17 U.S.C. § 106(2), which Paramount had owned pursuant to the ~~Grant~~1983 Agreement, but lost on January 24, 2020, and willfully proceeded to exploit nonetheless.

~~38~~40. Paramount was placed on clear notice of these issues on January 23, 2018 when the Yonays served Paramount with their statutory Notice of Termination, effective January 24, 2020. On May 11, 2022, the Yonays sent Paramount a cease-and-desist letter regarding the 2022 Sequel. On May 13, 2022, Paramount responded in total denial of the fact that its 2022 Sequel was obviously derivative of the Story. Paramount additionally argued that the 2022 Sequel was "sufficiently completed" by January 24, 2020 (the effective termination date) in a disingenuous attempt to bootstrap the 2022 Sequel into the "prior derivative works" exception to termination, 17 U.S.C. § 203(b)(1).

~~39~~41. Plaintiffs are informed and believe by Paramount's conduct, and based thereon allege that Paramount will continue to prepare, produce, copy, distribute, exploit, and/or authorize others to prepare, produce, copy, distribute, or exploit the infringing 2022 Sequel and other derivative works which copy and exploit the Story in violation of the Copyright Act.

~~40~~42. As a direct and proximate result of Paramount's actions, the Yonays will suffer imminent and irreparable harm, much of which cannot be reasonably or adequately measured or compensated in damages.

COUNT I: ~~DECLARATORY RELIEF~~BREACH OF CONTRACT

~~41~~43. Plaintiffs re-allege and incorporate by reference paragraphs 1 through ~~40~~42 inclusive, as though fully set forth herein.

44. The 1983 Agreement was a valid contract entered into by the Author and Paramount.

45. The Yonays are the heirs of the Author and, as such, are the successors-in-interest to the Author's rights and entitlements under the 1983 Agreement.

46. The Author fulfilled any and all of his obligations and has performed and/or complied with any and all terms and conditions of the 1983 Agreement that the Author was required to perform and/or comply with, and is in no matter or respect in breach of the 1983 Agreement.

47. The Yonays, as the Author's successors, are likewise in no matter or respect in breach of the 1983 Agreement.

48. In the 1983 Agreement, Paramount expressly agreed "to announce on the film of any motion picture photoplay that may be produced by it hereunder and substantially based upon or adapted from said work or any version or adaptation thereof, substantially incorporating the plot, theme, characterizations, motive and treatment of said work or any version or adaptation thereof, that said motion picture photoplay is based upon or adapted from or suggested by a work written by the Author, or words to that effect[.]"

49. The 1986 Film was unquestionably based upon or adapted from the Story and substantially incorporated the plot, theme, characterizations, motive and treatment of the Story. As such, the 1983 Agreement obligated Paramount "to announce on the [1986 Film] . . . that said motion picture photoplay is based upon or adapted or suggested by a [Story] written by the Author", i.e., to give the Author credit on the 1986 Film. Accordingly, Paramount provided the Author and his Story with credit on the 1986 Film just as it was required to do.

50. The 2022 Sequel was also substantially based upon or adapted from the Story and incorporated the plot, theme, characterizations, motive and treatment of the Story. As such, the 1983 Agreement obligated Paramount "to announce on the [2022 Sequel] . . . that said motion picture photoplay is based upon or adapted or suggested by a [Story] written by the Author."

51. In addition, the 1986 Film easily qualifies as an "adaptation" of the Story which Paramount obviously purchased in the 1983 Agreement to develop and produce a film based thereon. Accordingly, Paramount was obligated under the terms of the 1983 Agreement to provide credit to the Author and his Story on the 2022 Sequel because, at a minimum, the 2022 Sequel was "substantially based upon or adapted from . . . [an] adaptation" of the Story, i.e., the 1986 Film, and "substantially incorporate[ed] the plot, theme, characterizations, motive and treatment of said . . . adaptation thereof," the 1986 Film. The 2022 Sequel not only included these elements from the 1986 Film, it even included clips from the 1986 Film.

52. Paramount willfully failed to provide the Author with credit on the 2022 Sequel, as required by the 1983 Agreement, breaching the 1983 Agreement.

53. Further, Paramount's attempts to craft around giving the Author credit by claiming, in bad faith, that the 2022 Sequel was not based on the Story nor any adaption based on the Story (i.e., the 1986 Film), breached the implied covenant of good faith and fair dealing in the 1983 Agreement.

54. In so doing, Paramount did not act fairly and in good faith.

55. As a direct and proximate result of Paramount's breach of the 1983 Agreement, the Yonays have suffered damages, including but not limited to the diminution of the Author's stature as a writer and the consequent diminution of the value of the Author's Story and all of the Author's other works, in an amount to be adjudicated and determined at trial, plus pre-judgment interest.

56. The Yonays have no adequate remedy at law for many of their injuries suffered due to Paramount's breach and failure to provide the Author with credit on the 2022 Sequel, and such injuries cannot be reasonably, adequately, or precisely measured or compensated in damages.

57. The Yonays are therefore entitled to a permanent injunction ordering Paramount, its agents, employees, licensees and assigns, to provide the Author and his Story with credit on the 2022 Sequel in compliance with the terms of the 1983 Agreement.

COUNT II: DECLARATORY RELIEF

58. Plaintiffs re-allege and incorporate by reference paragraphs 1 through 57 inclusive, as though fully set forth herein.

~~42~~59. By reason of the foregoing facts, an actual and justiciable controversy has arisen and now exists between the Yonays and Paramount regarding whether Paramount continued after January 24, 2020 to have the rights to produce and exploit the 2022 Sequel and other derivative works based in whole or in part on the Story and the 1986 Film, derived from the Story.

~~43~~60. As of January 24, 2020, the Yonays own all rights in and to an enforceable copyright to the Author's original Story.

~~44~~61. The Yonays contend and Paramount denies that the 2022 Sequel does not qualify for the "prior derivative works exception" under 17 U.S.C. §203(b)(1) because it was not completed until long after January 24, 2020.

~~45~~62. The Yonays contend and Paramount denies that the 2022 Sequel, like the 1986 Film, is derived from the Author's Story.

~~46~~63. The Yonays contend and Paramount denies that, but for the Story, the 1986 Film and 2022 Sequel would not exist.

~~47~~64. The Yonays therefore desire a judicial determination that the 2022 Sequel is derivative of Ehud Yonay's Story.

~~48~~65. The Yonays further desire a judicial determination that Paramount does not have any rights to make, exploit, or distribute the 2022 Sequel or any other derivative work based in whole or in part on the Story, and/or the 1986 Film (as derived from the Story), in the United States.

~~49~~66. A declaration of the Court is necessary and appropriate pursuant to the Declaratory Judgment Act, 28 U.S.C. §§ 2201 *et seq*., so that the Yonays may ascertain their rights with respect to the 2022 Sequel and any future derivative works based in whole or in part on the Story, and/or the 1986 Film.

COUNT ~~II~~III: COPYRIGHT INFRINGEMENT

~~50~~67. Plaintiffs re-allege and incorporate by reference paragraphs 1 through ~~49~~66 inclusive, as though fully set forth herein.

~~51~~68. The Story is a wholly original Story and copyrightable subject matter under the laws of the United States.

~~52~~69. The Story was originally published on April 21, 1983 and was registered in the U.S. Copyright Office on October 3, 1983 under registration number TX0001213463.

~~53~~70. By its exploitation and release of the 2022 Sequel, a motion picture plainly derived from the Story, Paramount knowingly and willfully infringed, and will continue to infringe, the Yonays' copyright and rights under copyright in the Story.

~~54~~71. Each infringement by Paramount and/or other parties of the Story constitutes a separate and distinct act of infringement.

~~55~~72. The Yonays sent an email and certified letter to Paramount on May 11, 2022 placing Paramount on notice of its infringement, yet Paramount continues to infringe the Yonays' rights under copyright in willful disregard of and indifference to the Yonays' rights.

~~56~~73. As a direct and proximate result of Paramount's copyright infringement, the Yonays have suffered and will continue to suffer severe injuries and harm, much of which cannot be reasonably or adequately measured or compensated in money damages if such wrongful conduct is allowed to continue unabated. The ongoing harm this wrongful conduct will continue to cause the Yonays is both imminent and irreparable. The Yonays' injuries and damages include, without limitation, repeated infringement of their copyright and interests, diminution of the value of their copyright and interests, loss of customers, dilution of goodwill, and injury to their business reputation.

~~57. Pursuant to 17 U.S.C. § 502, the Yonays are entitled to a preliminary injunction, during the pendency of this action, and to a permanent injunction, enjoining Paramount, its officers, agents and employees, and all persons acting in concert with it, from engaging in such further violations of the Copyright Act.~~

~~58~~74. The Yonays are further entitled to recover from Paramount the damages, including pre-judgment interest, they sustained and will sustain, and any income, gains, profits, and advantages obtained by Paramount as a result of its wrongful acts alleged hereinabove, in an amount which cannot yet be fully ascertained, but which shall be assessed at the time of trial.

~~59~~75. Alternatively, the Yonays are entitled to the maximum statutory damages recoverable, or for such other amounts as may be proper, pursuant to 17 U.S.C. § 504.

~~60~~76. The Yonays are further entitled to their attorneys' fees and full costs pursuant to 17 U.S.C. § 505.

~~COUNT III: INJUNCTIVE RELIEF~~

~~**61.** Plaintiffs re-allege and incorporate by reference paragraphs 1 through 60 inclusive, as though fully set forth herein.~~

~~62. Unless enjoined and restrained by order of the Court, Paramount's conduct will infringe the Yonays' copyright and interests.~~

~~63~~77. By reason of Paramount's ongoing ~~or imminent~~ copyright infringement ~~and Paramount's unfair trade practices and unfair competition against the Yonays~~, the Yonays have sustained and, unless and until Paramount is enjoined, will continue to sustain substantial imminent and irreparable injury, loss and damage, including repeated infringement of their copyright and interests, diminution of the value of their copyright and interests, loss of customers, dilution of goodwill, and injury to their business reputation.

~~64~~78. The Yonays have no adequate remedy at law for many of their injuries in that such injuries cannot be reasonably, adequately, or precisely measured or compensated in damages if such wrongful conduct is not restrained and is allowed to continue unabated.

~~65~~79. Pursuant to 17 U.S.C. § 502, the~~The~~ Yonays are entitled to a preliminary injunction during the pendency of this action and a permanent injunction ordering that Paramount, its agents, employees, licensees and assigns be enjoined from producing, reproducing, distributing and exploiting or authorizing the production, reproduction, distribution or exploitation of the 2022 Sequel and ancillary products based thereon, derived from the Story, and from engaging in any further violations of the Copyright Act.

PRAYER FOR RELIEF

WHEREFORE, the Yonays pray for judgment against Paramount as follows:

ON THE FIRST CLAIM FOR RELIEF

1. For compensatory and consequential damages, according to proof in an amount determined at trial, together with interest thereon as provided by law, plus pre-judgment interest; and

2. For a permanent injunction ordering Paramount, its agents, employees, licensees and assigns, to specifically perform pursuant to the terms of the 1983 Agreement by providing the Author and his Story with credit on the 2022 Sequel.

ON THE SECOND CLAIM FOR RELIEF

~~1~~3. For a declaration that the 2022 Sequel is derivative of Ehud Yonay's Story;

~~2~~4. For a declaration that, as of January 24, 2020, Paramount does not have and did not have any rights to make, develop, produce, or distribute the 2022 Sequel or any other derivative work based in whole or in part on the Story and/or the 1986 Film (as derived from the Story); and

~~3~~5. For an order preliminarily during the pendency of this action and thereafter, permanently, enjoining Paramount, its officers, agents, employees, licensees and assigns, and all persons acting in concert with it, from developing, producing, or distributing the 2022 Sequel and any other derivative work based in whole or in part on the Story and/or the 1986 Film.

ON THE ~~SECOND~~THIRD CLAIM FOR RELIEF

46. For an order preliminarily during the pendency of this action and thereafter, permanently, (i) enjoining Paramount, its officers, agents, employees, licensees and assigns, and all persons acting in concert with it, from infringing the copyright in the Story, in any manner, and (ii) enjoining Paramount, its officers, agents, employees, licensees and assigns, and all persons acting in concert with it, from engaging in or authorizing the production, reproduction, distribution, display and/or exploitation of the infringing 2022 Sequel and ancillary products based thereon, derived from the Story, without a new license from the Yonays;

~~5~~7. For compensatory and consequential damages, according to proof in an amount determined at trial, together with interest thereon as provided by law;

~~6~~8. For an accounting and restitution to the Yonays of all gains, profits and advantages Paramount has derived from its production, distribution, display and exploitation of the infringing 2022 Sequel, ancillary exploitations based thereon, and from its copyright infringement of the Story;

~~7~~9. In the alternative to actual damages, for statutory damages pursuant to 17 U.S.C. §504(c), which election the Yonays shall make prior to the rendering of final judgment herein; and

~~8~~10. For such other and further relief and remedies available under the Copyright Act, 17 U.S.C. §§ 101 ***et seq***., which the Court may deem just and proper.

ON ALL CLAIMS FOR RELIEF

~~9~~11. For the Yonays' costs of suit;

~~10~~12. For interest at the highest lawful rate on all sums awarded the Yonays other than punitive damages;

~~11~~13. For reasonable attorneys' fees; and

~~12~~14. For such other and further relief as the Court deems just and appropriate.

DATED: ~~June 6~~August 31, 2022

Respectfully Submitted,

TOBEROFF & ASSOCIATES, P.C.

By: */s/ Marc Toberoff*
Marc Toberoff

Marc Toberoff
mtoberoff@toberoffandassociates.com
Jaymie Parkkinen
jparkkinen@toberoffandassociates.com
TOBEROFF & ASSOCIATES, P.C.
23823 Malibu Road, Suite 50-363
Malibu, CA 90265
Telephone: (310) 246-3333
Facsimile: (310) 246-3101

Alex Kozinski
alex@kozinski.com
719 Yarmouth Rd, Ste 101
Palos Verdes Estates, CA 90274
Telephone: (310) 541-5885
Facsimile: (310) 265-4653

Attorneys for Plaintiffs

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiffs hereby demand a trial by jury for all issues triable to a jury.

DATED: ~~June 6~~August 31, 2022

TOBEROFF & ASSOCIATES, P.C.

By: */s/ Marc Toberoff*
Marc Toberoff

Marc Toberoff
mtoberoff@toberoffandassociates.com
Jaymie Parkkinen
jparkkinen@toberoffandassociates.com
TOBEROFF & ASSOCIATES, P.C.
23823 Malibu Road, Suite 50-363
Malibu, CA 90265
Telephone: (310) 246-3333
Facsimile: (310) 246-3101

Alex Kozinski
alex@kozinski.com
719 Yarmouth Rd, Ste 101
Palos Verdes Estates, CA 90274
Telephone: (310) 541-5885
Facsimile: (310) 265-4653

Attorneys for Plaintiffs

Exhibit I

Chart of Similarities

Story	2022 Sequel
• Story singles out and focuses on two jocular, up- and-coming lieutenants competing to make names for themselves at the "Top Gun" aerial combat school who became close friends and a team, sharing the cockpit of state-of-the-art fighter jet: Alex a.k.a. "Yogi" a hotshot pilot and Dave a.k.a. "Possum," his radar intercept officer ("RIO").	• 1986 Film1 focused on two jocular, up-and-coming lieutenants competing to make names for themselves at the "Top Gun" aerial combat school who became close friends and a team, sharing the cockpit of state-of-the-art fighter jet: Pete a.k.a. "Maverick" a hotshot pilot and Nick a.k.a. "Goose," his RIO, who dies in a flying accident. 2022 Sequel features hotshot pilot, Maverick, now older, and a key story element is his friendship with Goose, depicted in flashbacks and photos. Goose's legacy is also brought back in the form of his son, "Rooster," a Top Gun graduate.
• Yogi (age 26) is single and is described as having dark hair and movie star good looks. Possum (age 25) is "married [to] his high school sweetheart," Lisa, and is described as having wavy light brown hair and a mustache.	• In 1986 Film, Maverick is single, mid-twenties, good-looking (Tom Cruise), and Goose is married, with wavy light brown hair and a mustache. 2022 Sequel revolves around Maverick's memories and guilt re: Goose, Goose's wife, and their son, Rooster (wavy light-brown hair and a mustache).
• Yogi and Possum are portrayed as close "family": Possum "will spend more hours of [his] married years with Yogi that with [his wife]."	• Maverick and Goose are portrayed as close "family" in the 1986 Film and 2022 Sequel, and Maverick treats Rooster like a son.
• Yogi wanted to fly since he was a young boy.	• Maverick and Rooster wanted to fly since they were young.
• Portrays Yogi ~~is~~as being enamored with high- intensity flying of the fastest fighter jets. He "wanted to fly ever since he was twelve." It "blew his mind," "but there was [an] admission price to the land of the giants." To fly the best fighter jets, he had to be the best ~~("only by being at the top of the Class could I get my choice of flying fighters, and get to fly F-14s.").~~.	• Maverick is enamored with high-intensity flying of the fastest fighter jets. Flying is all he ever wanted to do. He strived to be and was at the top of his class. 1986 Film portrays him this way and 2022 Sequel has him continually striving to be the very best of the best.

[1] The 1986 Film is referenced with the 2022 Sequel when this provides context for understanding the similarity in the 2022 Sequel. Otherwise, if not separately delineated, the similarities below refer to the 2022 Sequel.

Story	2022 Sequel
• "Yogi was still in junior high school when he realized that flying straight and level might be okay for some people, but if you like yanking and banking—the feeling of riding inside one of those storm-in-a-bottle souvenirs—then there's just one place for you, and that's the cockpit of a fighter plane."	• It is clear in the 1986 Film and 2022 Sequel that the only place where Maverick is truly at home is inside the cockpit of a fighter jet. In the 2022 Sequel, when he may have to give up flying fighter jets, it is like his whole world is being taken away and he can hardly fathom life without it.
• Yogi is portrayed as being seriously focused and dedicated to continually improving his fighter-jet flying, combat, and tactical skills.	• Maverick is seriously focused on cutting-edge flying and tactical skills in both the 1986 Film and 2022 Sequel and continuously pushes his own (and the Navy's) limits (e.g., forcing newest hypersonic plane to speeds exceeding Mach 10).
• "Just getting to [Top Gun~~, Miramar's Navy Fighter Weapons School~~] was the ultimate break. Only the best young flyers in a squadron ever make it, and they have already raced past most fighter pilots their age. If they play it right and look sharp, they might even get invited back as Top Gun instructors ~~-~~-- which is as high as a fighter pilot can get."	• In 2022 Sequel, Maverick, now legendary, is invited back to Top Gun as an instructor to train ~~former graduates,~~ the best-of-the-best fighter pilots~~, who have already raced past most other fighter pilots~~.
• "The first thing they see" when Yogi and Possum enter the Naval Air Station is a sign that says "WELCOME TO FIGHTERTOWN U.S.A."	• When Maverick enters the Top Gun Naval Air Station, ~~camera focuses on a sign that~~on-screen title card says "WELCOME TO FIGHTERTOWN U.S.A."
• The Naval Air Station, despite its supersonic, high- tech jets~~,~~ and rigorous training exercises, is romanticized and is portrayed as evoking 1950s post-war nostalgia: "Like the notion of the single- combat warrior, there is something slightly nostalgic about Naval Air Station Miramar. At night the darkened base could be mistaken for an old From Here to Eternity set, and even earlier in the day, when the base is bustling, it is enveloped in a time warp of unreality."	• Despite its hypersonic, high-tech jets, and rigorous training exercises, the Naval Air Station ~~and interaction between the pilots~~ is endearingly depicted with "1950s post-war nostalgia" and romanticized, as if ~~in~~from a ~~time warp.~~bygone era. See e.g., https://whstheshield.com/2020/12/08/top-gun-propaganda/ (1986 Film); https://www.fox4news.com/news/top-gun-maverick-review-top-gun-2-tom-cruise-miles-teller (2022 Sequel).
• The Story is set at the "Top Gun" school at the Naval Air Station in Miramar, CA, which is close to the Pacific Ocean and beach.	• The setting of the 2022 Sequel, which takes place in the present, is nonetheless a Top Gun school at a Naval Air Station near the ocean and beach, even though the actual

Story	2022 Sequel
	~~"~~"Top Gun" school moved in 1996 from Miramar, CA to land-locked Fallon, NV.
• Yogi and Possum form a crew and, ~~along with several~~after their training, join other crews~~,~~ to form a battle-ready fighter squadron, the "Wolfpack." ~~After their training they will become part of a battle-ready squadron.~~ "For as long as they remain in battle the Wolfpack will be their home and family, security blanket and confessional circle."	• In 1986 Film, Maverick and Goose form a crew and, ~~along with~~after their training join other top crews, ~~comprise~~to form a fighter squadron. In the 2022 Sequel, Maverick instructs top crews comprising a fighter squadron in preparation for battle, which he leads. The squadron is portrayed as a close-knit family, personally involved with, and reliant on, one another.
• Emphasizes playful nicknames of lead characters, "Yogi" and "Possum," and others (e.g., "Heater," "Tiger One," "Ratchet").	• Emphasizes playful nicknames of lead characters, "Maverick," "Rooster" ("Goose's" son) and of others, whose nicknames are sources of comedic relief (e.g., "Baby on Board 'Bob,'" "Hangman").
• ~~True~~Themes of jocular true grit, patriotic American~~-style~~ nostalgia, the difficulty in balancing duty, love, and ~~patriotism~~family, intergenerational divides, man versus machine, and the freedom that can only be found in the skies pervade the Story.	• ~~True~~Themes of jocular true grit, patriotic American~~-style~~ nostalgia, the difficulty in balancing duty, love, and ~~patriotism~~family, intergenerational divides, man versus machine, and the freedom that can only be found in the skies pervade the 1986 Film and 2022 Sequel.
• Characterizes fighter pilots as elite "hotshots" who are macho and cool. "Top Gun's hotshot aces have virtually revolutionized the fighter pilot business and . . . established themselves as the international masters of the deadly art of air-to-air combat."	• Characterizes fighter pilots as elite "hotshots" who are macho and cool. To form an elite squadron, the Navy assembles the No. 1 Top Gun graduates in each class who have established themselves as the masters of the deadly art of air-to-air combat.
• Features Top Gun graduate, Randy Cunningham, as legendary because he not only downed "three MiGs [Russian fighter jets] in one day, but because those three took them over the magic five-kill line to make him the first official ace."	• Maverick is legendary for being the only pilot to shoot down three MiGs in one day, shown in the 1986 Film, and touted in the 2022 Sequel, where, after Maverick shoots down two more enemy jets, it is touted that this takes him over the five-kill line to make him the first official Top Gun "ace."
• Emphasizes those fighter jet instructors who "could speak with the authority of actual combat experience."	• Maverick's extreme combat experience is compared to the elite pilots' lack of actual combat experience.
• "At Top Gun, back in those postwar days, everybody was hot. So hot that the place sizzled even when nothing was	• When Maverick first shows up at the Naval Air Station, the Admiral in command conveys that he is a thing of the past, a

Story	2022 Sequel
happening. So hot that a lot of people suggested that even Randy Cunningham didn't truly belong there. Not that he wasn't a great fighter pilot. His three-MiG day was awesome."	dinosaur. And despite Maverick's legendary status and three-MiG day, the new elite fighter jocks refer to him as "Pops" or "Old Man."
• Portrays an aviation "caste system" with "dividing lines drawn like the circles around the bull's eye." On the outside, bomber pilots, next attack pilots who charge at ground targets. "In the inner rings, where fighter pilots belong, there are finer distinctions that only the pilots themselves can discern, until one tiny circle is left at the center, the bull's-eye, where the elite of the fighter elite stand in glorious isolation. The greatest of the greats, the makers of legends~~– the 'shit-hots.'"~~ —the 'shit-hots.'" The bull's-eye was chosen as a metaphor for a fighter pilot's ability. The closer to the bull's-eye, the greater the ability of the pilot.	• To form a squadron for a special mission, the top Top Gun graduates gather for training by Maverick, a fighter-pilot referred to as "legendary." It is repeatedly emphasized that they are the fighter elites, the best of the best, they are hotshots. When Maverick first encounters the cockiest of them all, Hangman, he is throwing darts, consistently landing three-out-of-three in the bull's-eye. This is used as a metaphor to illustrate that he is the elite fighter pilot with the greatest ability.
• "[T]his fighter pilot's Valhalla almost came to an end in late 1977, when a new Admiral assumed command of the Naval Air Station and set out to restore discipline and naval decorum . . . Suddenly the old peacetime regulations were being enforced, and before long the hotshots began to leave."	• Instead of hailing Maverick as a hero, the Admiral at Top Gun makes clear that irreverent hotshots like Maverick have no place in his Navy, and the Vice Admiral under him values rules and regulations above the need of a top fighter pilot like Maverick to adapt quickly and instinctually to win.
• Notes that the Top Gun's dark ages lasted until the rigid Admiral was replaced by another who "was a fighter pilot's pilot . . . A sigh of relief swept the fighter jock community, but by then so many of the original hotshots had left that hardly anybody with any war experience was available for a Top Gun instruction post."	• Despite the disdain of the rigid Admiral, Maverick is asked to report to Top Gun to fill an instructor post to train the elite squadron because another Admiral (Iceman in the 1986 Film), a fighter pilot's pilot, who flew combat missions with Maverick, recognizes his value and war experience.
• Characterizes Top Gun as a critical component of American national security. "IF WAR BROKE OUT AND THIS country's aviators were ready for it, it would be a first, and the credit would belong entirely to Top Gun."	• Portrays Top Gun ~~Air Station is where~~fighters as the ~~Navy chose to assemble the elite fighter jet squadron comprised of the best-of-the-best aviators to~~only ones who can accomplish a seemingly impossible mission in enemy territory, vital to American national security.

Story	2022 Sequel
• Portrays Top Gun command as being fussy, finicky, and fawning over the pilots. "Fightertown . . . the entire mission . . . is to primp and fuss . . . [over] fighter jocks so that when the time comes and they're staring down the missile racks of [enemy jets], they are primed and ready."	• The Top Gun command primps and fusses over these best-of-the-best fighter jocks and their training so they are primed and ready for a difficult mission in enemy territory.
• Top Gun fighter pilots are portrayed romantically and metaphorically as elite knights, with a special code of honor, jousting in shining armor. For example: "If Miramar is a fighter pilot's Camelot, then [] Top Gun . . . is King Arthur's Round Table, the gathering of the greatest of the greats in fighter aviation."	• The greatest fighter pilots are assembled and, along with Maverick, their legendary leader, are portrayed romantically as ~~elite~~ crusaders—members of an elite order, with a special code of honor.
• Aerial combat training is portrayed as very competitive and Yogi, as extremely competitive: "In this business you hate to lose . . . and getting shot is synonymous with losing."	• Aerial combat training is portrayed as very competitive and Maverick, as extremely competitive, even as he returns to Top Gun as a much older instructor.
• Fighter crews are crestfallen when they are outmaneuvered and "shot down" ~~in~~even though it is just a part of their training. ~~"You feel just like kicking yourself in the butt," Possum says.~~	• Fighter crews are completely crestfallen when they are outmaneuvered and "shot down" ~~in~~even though it is just a part of their training.
• ~~Failed~~Sequences failed aerial combat ~~maneuver by Yogi and Possum is~~maneuvers immediately followed by quiet, serious tactical discussions between ~~them~~fighters in the briefing room.	• Failed aerial combat maneuvers by the elite fighters are followed by debriefing and tactical analysis in the classroom.
~~• "Say you're entering bogey [enemy] country. To find out what's ahead, push the air-to-air weapon select button with your right thumb. (This is basically an 'on' switch your head-up display and digital display indicators are now operating."~~	~~• Features closeup of pilots pushing the air-to-air weapon select button with the pilots' right thumbs.~~
~~• Emphasizes, the fighter jet's "right-hand digital display indicator. If there's a bogey [enemy plane] out there, it will appear on this screen as a small black square. To lock your radar onto its tail, press the throttle's acquisition button until the screen's acquisition symbol (two parallel vertical lines)~~	~~• Repeated camera closeups of similar controls and functions in the fighter jets during elite squadron's combat training and mission.~~

Story	2022 Sequel
~~brackets the target. Suddenly the acquisition symbol disappears, and a numbered aiming circle appears around the black square this tells you at a glance how fast, how high, and in what direction the bogey is going . . . Pull the stick's missile release or gun trigger with your right index finger. Bingo."~~	
~~• Emphasizes the afterburner in top fighter jets, an engine component that, at the pull of a throttle, burns huge amounts of fuel at incredible speed, resulting in a burst of raw power that no ordinary jet engine can duplicate and only a fighter needs.~~	~~• Repeated shots of pilots pulling the throttle of their top fighter jets causing a huge burst of raw engine power.~~
• Colorfully characterizes and portrayals of dry mechanical details of a fighter jet: • Emphasizes the afterburner in top fighter jets, an engine component that, at the pull of a throttle, burns huge amounts of fuel at incredible speed, resulting in a burst of raw power that no ordinary jet engine can duplicate and only a fighter needs; • "Suddenly the acquisition symbol disappears, and a numbered aiming circle appears around the black square—this tells you at a glance how fast, how high, and in what direction the bogey is going . . . Pull the stick's missile release or gun trigger with your right index finger. Bingo."; • "Say you're entering bogey [enemy] country. To find out what's ahead, push the air-to-air weapon select button with your right thumb. (This is basically an 'on' switch-your head-up display and digital display indicators are now operating.)"	• Repeated dramatic shots of pilots pulling the throttle of their top fighter jets causing a huge burst of raw engine power, and compelling closeups of the pilots activating mechanical components, such as the triggering of the aiming circle that tracks the "enemy" jet's movements, index fingers on gun triggers, and the pushing the air-to-air weapon select button which lights up the system with a digital display.
• Flying is depicted with weightless fluidity: "they're floating in their glass bubble through a . . . blue on blue crystal morning . . . Yogi whips the stick . . . from side to side and the plane rolls this way and that, letting him and Possum spot	• Flying is depicted with weightless fluidity in a vast blue expanse, with little distinction between up or down, left and right, as glistening silver fighter jets angle, roll, and rocket through the sky.

Story	2022 Sequel
anybody making for their tail. From where they sit, however, it's not their silver rocket that's rocking but the entire vast blue dome of sea and sky. There are no ups or downs up here, no rights or lefts, just a barely perceptible line separating one blue from another, and that line is spinning and racing like mad in the distance."	
• Portrayal of aerial combat training as edgy and intense, and ~~emphasizes~~builds dramatic tension by emphasizing that the slightest mistake can be deadly and cost lives. "You wish you could do it over again . . . but in the real world you're not going to get a second chance."	• Portrayal of aerial combat training as edgy and intense, and emphasized that the slightest mistake can be deadly and cost lives. Similar statements by Maverick and other pilots.
• ~~Aerial~~Creates suspense by characterizing aerial combat training ~~is portrayed~~ as rigorous, and of life-or-death importance. "'You fight like you train, so you'd better train like you're going to fight,' fighter pilots like to say."	• ~~Aerial~~Portrays aerial combat training ~~is portrayed~~ as rigorous, and of life-or-death importance. Similar statements by elite fighter pilots in the 2022 Sequel.
~~• "[Yogi and Possum] spent hours talking tactics in the briefing room before and after missions" and combat training sessions.~~	~~• The elite squadron and Maverick repeatedly talk tactics in the briefing room before and after aerial training and before their mission.~~
• Fighter-jet crews exhibit a machismo attitude in challenging each other (e.g., "moving up to the F- 14 Tomcat meant crossing the magic line that separates the men from the boys~~"; "'Fight's on,' says Yogi~~").	• Fighter-jet crews exhibit a machismo attitude in in challenging each other in the sky and back at the base.
• ~~Training~~Fierce training "dog fights" are ~~portrayed as fierce, all while maintaining~~juxtaposed against a collegiate and convivial team spirit.	• Training "dog fights" are portrayed as fierce, all while maintaining a collegiate team spirit.
• Aerial combat training is portrayed by juxtaposing the ethereal beauty of the skies (the "vast blue dome of sea and sky") with jarring unpredictable action at gut-wrenching speeds.	• Aerial combat training is portrayed by juxtaposing the ethereal beauty of the skies (the "vast blue dome of sea and sky") with jarring unpredictable action at gut-wrenching speeds.
• Repeated references to pulling too many Gs (e.g., "When you are pulling Gs—withstanding several times the force of the earth's gravitational pull—the pressure comes from	• Repeated references to and visuals of the fighter pilots and their WSO (the pilot in the rear of the cockpit) feeling the

Story	2022 Sequel
everywhere. Even your eyelids weigh several times what they normally do, and the pressure on your chest is so intense that you can hardly breathe.").	intense physical torture of pulling Gs, with particular focus on their strained faces under pressure.
• ~~It is said that if you pull~~Portrays the danger of flying by inviting the reader to imagine pulling too many Gs ~~repeatedly you start to black~~, blacking out, and ~~to just imagine~~ flying a jet at supersonic speeds ~~when you have blacked out~~while unconscious.	• One of the fighter pilots blacks out after pulling too many Gs in repeated maneuvers, and narrowly escapes death when his jet plummets toward the ground.
• A running theme that the sheer intensity of flying top fighter jets, "strapping on 25 tons of airplane," and pulling tortuous Gs at supersonic speeds is what adrenaline-junky top fighter pilots love and live for.	• A running theme that the sheer intensity of flying huge high-tech fighter jets, and pulling tortuous Gs at supersonic speeds is what adrenaline-junky top fighter pilots love and live for, particularly Maverick, who in a major scene pushes himself and his plane past a record-breaking Mach 10.
• "So, that's where it all starts. With the love of flying." Characterizes the love of flying as all- consuming, and as coming at the expense of personal and familial relationships.	• The 2022 Sequel ~~is a~~repeatedly emphasizes the characters' love ~~letter to~~of flying, even at the expense of personal and familial relationships.
• "Taking off and flying through those fluffy white clumps was a near-sexual delight. It didn't last. As we . . . began dogfighting with Yogi and Possum . . . [this] was brutally shattered . . . as Yogi and Possum drifted away, vanished, then turned and headed back in our direction. Suddenly Shoes whipped the stick hard . . . and before I could catch my breath or brace myself . . . he pushed the throttle and sent us into a sharp climb."	• Scenes with crews cruising in the serene sky until suddenly their tranquility is shattered by a fighter jet heading right toward them causing them to breathlessly ascend in a fast, sharp climb.
• "Shoes suddenly pointed the plane nose down and went into a dive. I couldn't keep track of Yogi and Possum's plane, streaking by like flashes of metallic light and nothing more."	• Depicts fighter pilots unexpectedly turning their planes nose down in a steep dive, while dueling planes streak by like flashes of metallic light.
• As plane dives, "I had never, felt so useless in all my life. I had lost control of everything that was happening from one second to the next, exactly the opposite of what fighter pilots feel—and must feel—all of the time."	• Maverick demonstrates and teaches the other fighter pilots that, to succeed in their mission, their focus and control must be total and they must react instantaneously and instinctually, with no time to think.

Story	2022 Sequel
• "There was more flying than they had ever had . . . one-versus-one hops (one student crew against one instructor) . . . then the tough two-versus-unknown hop, in which two crews take off not knowing . . . where the bogey [instructor "enemy" plane] will] come from . . . when the bogey rolls in and sends them home with a simulated [] shot. Before long the hops were running into each other, and Yogi and Possum noticed that something was happening to them. They were flying twice a day . . . edge-of-the-seat, hard flying, intense, mind-bending flying . . . They were being hammered into a team."	• The elite squadron engages in more rigorous back-to-back combat training than ever before. Maverick (as the instructor "enemy") takes on single crews one-on-one; then two crews are flying when Maverick rolls in behind them from nowhere, sending them home with a simulated shot. This edge-of-the-seat, hard, intense, mind-bending flying continues as the squadron is being hammered into an elite team.
• "Yogi and Possum were zipping along, shooting up mountains and down canyons and flying so low that it was hard to keep from staring at the ground, but they had to keep looking for bogeys."	• The mission requires the elite squadron to train and fly fast and extremely low to the ground through canyons and then to quickly shoot up mountains.
• "Yogi found out that his bogey had just fired a missile . . . with a heatseeking missile heading his way" he "break[s] hard–pull[s] away fast–to foul up the missile's tracking system . . . and head[s] up in a 7.5-G climb."	• When Maverick finds out that an enemy plane has just fired a heat-seeking missile which is heading his way, he brakes hard and pulls away fast to foul up the missile's tracking system and heads up in a high-G climb.
• Points out that at high angles of flight, not enough air flows into the engines of the top fighter jets, and they can die.	• In the 1986 Film, Goose dies after the fighter jet engine flames out as a result of poor air flow resulting in a fatal flat spin. Goose's death plays a prominent role in the 2022 Sequel which also features scenes where engines die in the middle of flight maneuvers.
• Points out that when faced with deadly accidents of others in training, fighter pilots have an incredible denial mechanism, and just keep flying: "That none of these accidents dampened the pilots' enthusiasm for the plane is just another clue to the fighter pilot's code . . . Planes take off and land every day without accidents, so obviously it can be done."	• After Goose's tragic death in the 1986 Film (the 2022 Sequel's backstory) Maverick and the others carry on flying. In the 2022 Sequel, despite a near-deadly accident in training, the fighter pilots also exhibit this incredible denial mechanism, and just keep flying. In training the elite squadron, Maverick discusses the dangers of the planned mission but insists, in the face of skepticism regarding dangerous maneuvers, and then demonstrates, it can be done.

Story	2022 Sequel
• Emphasizes that "accident reports that clearly demonstrate technical failures don't erase the [fighter pilot's] lingering doubt" that there must have been something he could have done but did not. Characterizes pilots as going out of their way to take responsibility for what happens in the air, regardless of what "reports" might say.	• After Goose dies in a flying accident with Maverick at the helm, Maverick, though cleared of blame in the accident report, cannot forgive himself and believes there must have been something he could have done to avoid it. This pervades the 1986 Film and the 2022 Sequel in Maverick's flashbacks and interactions with Goose's son.
• Crews in training are under intense time pressure and are set back if they botch training exercises. Yogi and Possum train against a ticking clock, "And now they [Yogi and Possum] have only three weeks left to make it up."	• Maverick and his elite squadron train under a ticking clock as they have only three weeks to be mission-ready. They are under intense time pressure and suffer setbacks when training exercises are botched.
• ~~Emphasizes~~Raises the dramatic stakes of flying errors by emphasizing the huge price tag of each fighter jet and the cost/difficulty of obtaining parts: "the biggest problem, however, is the F-14's price."	• Vice Admiral refers to huge, multimillion-dollar cost of a top fighter jet that crashed during training, at government expense.
• Running theme that, with all the high-tech machinery, it still comes down to people~~–~~—to a handful of courageous elite fighter-jet crews. "This is the anachronism of fighter aviation. Even in this age of remote-control, pushbutton warfare, the survival and effectiveness of the entire U.S. Pacific Fleet rests on a few dozen young men getting themselves catapulted off a flight deck and hanging it in the skies against numerically superior, land- based enemy planes."	• The Rear Admiral lectures Maverick that flyboys like him are obsolete, soon to be replaced by pushbutton drones. Maverick and the elite squadron he trained proves him wrong; that it all comes down to the skill and courage of people. Catapulted one-by-one into the sky off the flight deck of an aircraft carrier, they defeat superior land-based enemy missiles and numerically superior fighter jets against all odds. Maverick's arc shows that he still has a place in the Navy.
• Notes some hotshot pilots are irreverent of Navy command, and play games in the air. For instance, as legend has it, "thumping," where "a guy might be lying straight and level without a care in the world when another would come slinking behind and below, then shoot under him and go into a sharp climb right in front of his nose~~–~~—not only scaring the living daylights out of him but interrupting the air currents around his wings."	• In both the 1986 Film and the 2022 Sequel, the irreverent Maverick pulls this exact same "thumping" stunt, unexpectedly scaring the living daylights out of other top fighter pilots.

Story	2022 Sequel
• The hotshot fighter-jet crews, engaged in aerial showdowns, are portrayed as courageous cowboys (e.g., "At Mach 2 and 40,000 feet over California, it's always high noon."; "That's where fighter pilots such as Yogi and Possum figure in . . . to ride shotgun over the carrier's three squadrons of attack planes.").	• Maverick and some of the hotshot fighter pilots he trains are portrayed as audacious cowboys~~; their~~ with slick combat maneuvers ~~and~~ who engage in aerial one-on-one duels/showdowns ~~further evoke and enhance~~in a high-desert setting, evoking and enhancing the same "Western" analogy.
• Features a stunning air maneuver, the "vertical egg," in which two planes chase each other in ever- widening vertical loops.	• In an exhilarating aerial combat training scene, two planes are engaged in this, chasing each other in ever-widening vertical loops.
• ~~Describes bars with "black and yellow stripes" in F- 14 cockpit: "a warning sign. Pull up and squeeze them and an explosive charge will blast you out of the cockpit and into the air, your seat will drop away, your parachute will open above, and you will float safely down to earth.~~ Creates dramatic tension by emphasizing that there is no way to practice using a jet's ejection seat by pulling on its black and yellow striped bars. A pilot can only avoid death by remembering the steps. "That's how the ejection seat is supposed to work if anything goes wrong with the plane, but the trouble is you can't practice with it, only memorize a series of steps." (emphasis added).	• Features Goose's son, Rooster, in an F-14 cockpit when the plane has been shot. Camera focuses on black and yellow striped bars. Rooster frantically pulls on the bars to eject, but they just don't work. And, in the 1986 Film, Goose dies when he ejects but hits his head on the F-14's canopy in the execution of the ejection steps.
• Prominently features "a Blue Angel 'back-to- back'" stunt where a fighter pilot flies upside down close and parallel to another jet: "pilots demonstrate the agility and grace of their 25-ton monsters."	• Both the 1986 Film and 2022 Sequel prominently features this daring, elegant stunt performed by Maverick.
• Emphasized that the Wolfpack squadron leader does "200 push-ups . . . a day" in preparation for competitive aerial combat "joust[s]."	• When the top pilots are competitively training against Maverick, they place a "bet" that whosever plane is "shot" has to do "200 push-ups," followed by Maverick's trainees repeatedly doing 200 pushups on the tarmac. Rooster proves his worth by completing his 200 push-ups, after his superior says he can stop.

Story	2022 Sequel
• "[Yogi] finished flight school at the top of his class[.]" "Yogi and Possum finished the Top Gun course . . . As their class picture went up in the briefing room . . . the news came that the Wolfpack was named top fighter squadron on the West Coast—one of only two contenders for the Admiral Clifton Award, the navy's greatest tribute to a fighter squadron."	• In 1986 Film, Maverick finishes the Top Gun course at the top of his class, and this is mentioned as well in the 2022 Sequel. Further emphasized in 2022 Sequel that each of the members of the elite squadron being assembled for the mission graduated Top Gun at the top of their class.
• Emphasizes wooden plaques and an inner room at Top Gun school "covered from floor to ceiling with heavily carved wooden plaques—[]—[]like coats of arms—of the various squadrons."	• Features an inner room at Top Gun covered from floor to ceiling with carved wooden plaques, focusing on the plaque for Maverick's graduating class, showing Maverick and Goose together and a plaque featuring Iceman (now an Admiral) as No. 1 in that class.
• ~~Frat~~Intense training and flying is juxtaposed against frat-boy like R & R ~~is featured, particularly~~ at a ~~Top Gun~~ bar where the pilots drink beer and carouse. "It is the Wednesday night happy hour, and the small, noisy room is packed with pumped-up fighter jocks."	• Frat-boy like R & R is featured, particularly at a crowded, noisy Top Gun bar where pumped-up fighter-jet jocks drink beer and carouse.
• Portrays fighter pilot jocks as cocky and sometimes reckless. Stopped by police for speeding: "'It's all right, officer, we're from California,' a tanked-up marine hotshot once told a cop who had stopped him. 'This is California,' the cop answered, and wrote him up."	• Maverick is portrayed as cocky in the face of authority figures and reckless at times. Hangman, like Maverick in his youth, is also cocky and sometimes reckless.
• ~~Emphasizes that~~Portrays fighter pilots ~~fraternize~~fraternizing as a ~~lot~~way of bonding and blowing off steam. "They do it . . . for the same reason stunt men or [] cops or anybody else who hangs it out there for a living heads for a bar after a day's work. 'You're out there supersonic going from deck to 40,000 feet and back down to the deck, simulating killing people and getting yourself killed, handling actual emergencies, and when you finally come in and land you can't even tell your wife about it.'"	• After grueling dangerous training sessions, the fighter pilots fraternize together, bonding at the bar, playing crazy football shirtless etc. Close bond between Maverick and Goose, which ended in Goose's death, is featured, while Maverick struggles to maintain distance from his love interest given the dangers of his profession.
• Close camaraderie pervades the squadron, despite intense competition between the fighter jet crews. "The Wolfpack	• Close camaraderie pervades the squadron, despite intense competition between the fighter-jet crews. In one scene at

Story	2022 Sequel
organized a bash . . . to give naval aviators back from a cruise a place to let off steam. Anything goes, including, after enough beer went down one evening, pushing all the tables together in the shape of a carrier deck, stretching a few towels across, and doing belly landings."	their favorite bar, Goose's son, Rooster, unplugs the juke box and plays "Great Balls of Fire" as the others boisterously chime in. In another, the crews play a crazy game of shirtless tackle football where everyone plays both offense and defense.
• The Wolfpack squadron presents "a good-size brass bell" to the bar. "It was no ordinary bell. The Wolfpack had brought it for a purpose, to help uphold the club's bylaws, which state that a bell should be rung on two occasions—when someone walks into the club with his hat on, or when a customer finds himself behind the bar. On either occasion, the transgressor picks up the tab for everybody's drinks."	• Hanging behind the bar is a good-sized brass bell with a special purpose. As explained by the bar owner (Maverick's love interest), the bell is rung when someone breaks the house rules—no cell phones on the bar and don't disrespect a lady or the Navy. On either occasion, the transgressor (including Maverick) picks up the tab for everybody's drinks.
• "There were the drinking sessions . . . But most of all there was flying. Glorious flying. The greatest fighter flying in the world was taking place every day . . . as Top Gun's [] vets set out to rewrite every single fighter aviation text ever written."	• The 2022 Sequel is an homage to ~~flying,~~ incredible flying which we witness in the crews' combat training sessions and their actual combat mission. Maverick ~~must~~literally throws out the aviation textbook and seeks to rewrite the Navy's aviation rules (e.g., how low to the ground the top fighter jets can fly or how many Gs a pilot can pull in a steep ascent) to achieve the impossible mission he and his squadron must fly.
• As surprise R & R, the Wolfpack is presented with "a glorious sailing yacht" which they set out on.	• Maverick is taken for a surprise ride on a beautiful sailing yacht by his love interest.
• "[E]ven the greatest air battle is a series of individual duels—that, while a dozen pilots may blast off a carrier at one time, once they get up there they are alone, hurtling through enemy air at 750 miles an hour and tilting against tiny motes of silver that zoom out of the blue to become fire-spitting machines."	• The squadron blasts off an aircraft carrier for their mission, but as they try to make their way back through enemy airspace, they are isolated when attacked by enemy planes and the combat scenes are just like this.
• Describing true combat aerial "duels" "when one knight from each side would come out and they'd joust, one on a white horse and one on a black horse."	• Light silver fighter jets in the squadron engage in one-on-one duels with black enemy planes.
• Portrays a dangerous enemy encounter with playful cheekiness. "As they escorted the [Russian] plane away,	• In the 1986 Film, Maverick flies close to and level with a Russian MiG, smiles, and takes a snapshot of the Russian

Story	2022 Sequel
Yogi edged up so close that he could look over and see the Russians in their cockpit, staring at him . . . He waved the way one does when someone is taking pictures, but the Russians didn't wave back–—not even when Yogi's backseater took their picture."	pilot. In the 2022 Sequel, Maverick and his backseater, Rooster, fly close to and level with an enemy plane that is trying to escort them away, Maverick smiles and waves, but the enemy pilot does not wave back.
• Emphasizes that the F-14's "wings can sweep back for fast flying or open to the sides like an eagle's for landing or just for cruising around[.]"	• In the 1986 Film (where they mostly fly F-14s) this is not highlighted. But tellingly in the 2022 Sequel ~~it is~~, of all technical aspects, this one is selected as a plot point, as Maverick displays this ~~special~~ F-14 feature by using it to enable a very short takeoff ~~when the runway is~~on a bombed-out runway.
• ~~Emphasizes that~~Characterizes landing a fighter jet on an aircraft carrier in the middle of the ocean ~~can be very challenging ("the~~ as a "controlled crash ~~that is a carrier landing in the best of times . . .~~. . . if you are lucky ~~the sea is calm and the air is clear").~~."	• In a major scene after their mission, Maverick completes the harrowing task of landing an F-14 jet on an aircraft carrier, with his wheels shot off.
• A resounding affirmation of the dedication, focus, patriotism and true heroism of fighter pilots.	• A resounding affirmation of the dedication, focus, patriotism and true heroism of fighter pilots.
• "'Really great fighter pilots are like the great gunfighters in the Old West . . . They didn't have to tell anybody how great they were–—all they had to do was just stand there, and the aura was such that everybody knew. It's the same here. Everybody knows.'"	• Maverick, the most legendary Top Gun pilot, is portrayed like this ~~at the end of his arc in~~throughout the movie. E.g., Cyclone remarks that Maverick's reputation as a great fighter pilot and troublemaker precedes him; Maverick sits relaxed at the bar while he causally looks on as the other hotshot pilots compete for status with bravado.
• Settings and their sequencing: jumps between base scenes, classroom scenes, bar scenes, sailing scenes, mission scenes, and flashbacks, with intense flying scenes interspersed throughout.	• Settings and their sequencing: jumps between base scenes, classroom scenes, bar scenes, sailing scenes, mission scenes, and flashbacks, with intense flying scenes interspersed throughout.
• Story takes place on a naval base with weapons of war but focuses on the backstories, passions, and dreams of those who are stationed there.	• Story takes place on a naval base with weapons of war but focuses on the backstories, passions, dreams, and past regrets of those who are training there.

Story	2022 Sequel
• Intergenerational tensions between the older experienced pilots (now instructors) and the younger generation of restless, ambitious up-and- coming fighter pilots.	• Intergenerational tensions between the older experienced Maverick (now an instructor) and the younger restless fighter pilots.
• Recurring theme that success in warfare comes down to the pilot, his courage and strength of character, not the high-tech jet he's flying.	• Recurring theme that success in warfare comes down to the pilot, his courage and strength of character, not the high-tech jet he's flying.